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ABSTRACT

To change the negative attitudes of academically disadvantaged students toward school and prepare them to succeed in high school vocational programs, 27 boys were selected to participate in a 3-year activity-centered instructional program. A problem-solving approach was used for learning experiences in applied biology and agriculture, mathematics and finance control, communication, and physical education. Facilities included a land laboratory in addition to regular classrooms. Most of the students were interested in and receptive to the program. Their attendance improved, and a change in attitude toward learning and learning involvement was evident. In addition, their reading, speaking, and writing abilities improved. A curriculum guide is included which contains suggestions for administrators and teachers concerning the instructional staff, facilities, student selection, advisory committee, parental support, and the instructional program. The problem areas of the instructional program contain objectives, teacher preparation, procedural steps, and equipment. (SB)

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A PREVOCATIONAL LABORATORY CENTERED CURRICULUM FOR RURAL DISADVANTAGED YOUTH

ED0 44517

THE WARSAW PROJECT

Final Report

July 1, 1970

by

Robert W. Walker

AGRICULTURAL EDUCATION DIVISION
VOCATIONAL AND TECHNICAL EDUCATION DEPARTMENT

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Final Report
July 1, 1970

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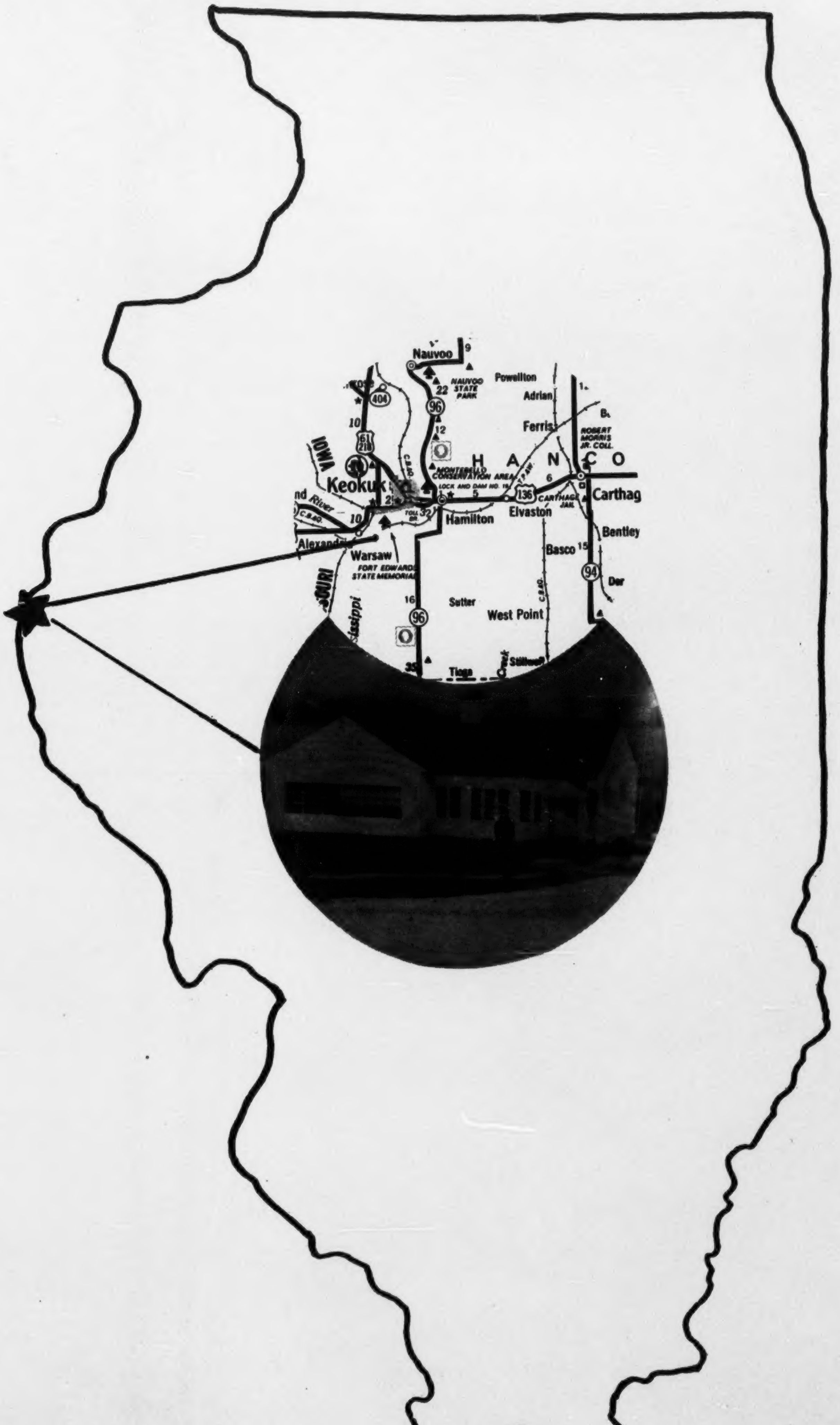
LOCATION OF THE WARSAW PROJECT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PART I

PROJECT REPORT

Introduction

In July 1967, an educational program was implemented at the Warsaw Community High School in central Illinois along the Mississippi Rover to meet the needs of disadvantaged students. At the same time, the Agricultural Education Division, the University of Illinois, started a parallel research project to help the Warsaw school plan, implement and evaluate the program. This report describes the major activities conducted at the Warsaw High School and the involvement in the project of the research team at the University of Illinois.

The need for a program for academically disadvantaged students at Warsaw High School was evident to members of the high school staff and their concern was expressed to the staff in Agricultural Education at the University of Illinois, who in turn agreed to help to develop a program to meet the needs of the students.

Situation

Observations over a number of years had indicated to the teaching staff at Warsaw that a number of boys entering high school were unable to achieve at an acceptable level. For certain identifiable reasons which will be stated, boys had developed poor attitudes toward study or work, whether academic or vocational. Either condition tended to contribute to school drop-out. The students' sense of civic responsibility fell far short of that demanded of them in the years ahead.

The advantaged student

It was determined that the attitude students had toward school, teachers, or educational involvement was learned as the students interacted in the formal educational environment. Successful experiences for students in this environment caused most students to accept school, their teachers and the system of education. For these people learning achievement was at an acceptable level. Success tended to beget success. Each felt that school was worthwhile.

The disadvantaged student

Not all students were successful in school. For one reason or another some of the students had not gained sufficient competency in reading, writing, speaking, or computing skills to perform at an acceptable level in the classroom. Poor performance on the part of these students was due to their inability to use the basic scholastic skills. Achievement was low and they failed to meet academic standards set by the school. Failure begot failure and the students developed hostile attitudes toward the school, the teachers, and the traditional educational environment. These attitudes served as a shell of protection against further intimidation by the educational system in which there was little change for success; a system in which an educational program did not exist to meet the needs of slow learners and underachievers with hostile attitudes. These students became potential dropouts.

The foregoing reasoning caused the teacher of agriculture, counselor, and the superintendent of schools to see the need for a program designed to specifically meet the needs of academically disadvantaged students.

The regular school programs are not designed to meet the needs of disadvantaged students

There was a definite need to stop the practice of directing disadvantaged students into established occupationally oriented education programs such as industrial arts, building trades or regular vocational agriculture. These courses emphasized the development of occupational knowledges and skills and were not designed to deal directly with the special needs of certain students. Consequently, the programs were hindered by the disadvantaged students. A conflict in program objectives developed as the instructor attempted to meet the occupational needs of well adjusted students and at the same time "turn on" and teach basic scholastic skills to the disadvantaged.

The proposal

The academic difficulty with many disadvantaged students appeared to be attributed to the lack of interests or the presence of poor attitudes rather than the lack of natural ability. Further, it was learned that approximately one-third of rural eighth grade boys had interest in applied biology and agriculture.

An assumption was made that interest in applied biology and agriculture could be used by the agriculture occupations teacher to serve as a vehicle to carry students into learning activities designed to change their attitude toward their teachers and educational involvement and open the way for the development of basic scholastic skills.

The foregoing assumption provided the impetus for the agriculture instructor proposing that the program be implemented by the agriculture department at Warsaw. Certainly the Vocational Education Act of 1963 and later, the 1968 amendments provided encouragement to go in this direction by placing special emphasis on programs designed to meet the needs of the disadvantaged.

This report which culminates in a suggested curriculum guide will assist school systems throughout the state of Illinois and the nation to develop programs to meet the need of the rural and urban disadvantaged.

The problem

Some ninth and tenth grade boys at the Warsaw High School were academically disadvantaged. They did not possess the basic scholastic skills needed for successful participation in regular school programs. School was a series of unsuccessful experiences for many of these students. They developed hostile attitudes toward school, teachers, and the traditional educational environment. To these students, the traditional educational involvement was not relevant.

Would vocational education meet the needs of these students? Unfortunately, the answer was "no". Many academically disadvantaged students did not succeed in vocational programs in which they exhibited an interest. As in the regular non-vocational school program, students lacking the basic scholastic skills were unable to successfully complete vocational courses of study. Again, the students failed, became dissatisfied, and dropped out of school.

How did the problem evolve? The answer is not simple but the following steps were suggested by the guidance counselor at Warsaw:

1. The typical academically disadvantaged student who lacked the basic skills of reading, writing, speaking and computation did not learn rapidly.

2. The inability of the student to learn at an acceptable rate contributed to low achievement.
3. Low achievement was not rewarded.
4. The lack of reward contributed to the students dissatisfaction with the school.
5. The need for success by the student was not met by the school and the student looked elsewhere for success and fulfillment.
6. The school and parents prevented the student from breaking away from the daily encounter with a situation which he could not cope.
7. The student chose to withdraw or stay away from school.
8. He developed an unfavorable attitude toward teachers and the school system.
9. He became a problem for the school, his parents and society.

Definition of Terms

Basic scholastic skills

The basic scholastic skills were reading, writing and arithmetic. All of the students in the project were underachieving in one or more of the skills.

Disadvantaged students

The study focused on the academically disadvantaged classified as such because all were slow learners and underachievers. Most of the students were also socially and economically disadvantaged.

Land laboratory

The elementary grade school, playground and woodland was called the land laboratory.

New Opportunities program

The name given to the program at Warsaw High School designed to meet the special needs of academically disadvantaged students.

OBJECTIVES

This project was designed to plan, implement and evaluate an activity centered instructional program in applied biology and agriculture for disadvantaged youth.

The main objective of the experimental program was to change the negative attitudes of academically disadvantaged students toward school, teachers and "learning involvement" and prepare the students to enter and succeed in high school vocational programs.

More specific objectives for the joint project between the Warsaw High School and the University of Illinois follows:

Specific Objectives for Warsaw High School

1. To identify, counsel and enroll in the instructional program academically disadvantaged students possessing an interest in applied biology and agriculture.
2. To locate land and facilities to serve as the land laboratory.
3. To prepare the land laboratory for instructional use.
4. To identify instructional units and problem areas that could be taught at the land laboratory.
5. To develop an activity centered instructional program.
6. To identify and select instructional aids suitable for use with students who lacked the basic scholastic skills.
7. To coordinate the land laboratory instructional activities with instructional activities in communications and mathematics.
8. To conduct meetings and workshops to modify traditional courses so disadvantaged students returning to the regular school program succeed.

Specific Objectives for the University of Illinois

1. To serve as consultant to the Warsaw Community Unit No. 316 High School for the development of an applied biology and agriculture oriented, land laboratory facility into a learning environment for academically disadvantaged youth.
2. To provide special instructional analyst services to the school to insure that the program was worthwhile and was organized so that it could be effectively evaluated.
3. To develop and adapt teaching materials and teaching plans for use by the teachers in the program at Warsaw.
4. To determine objective results of the experimental program.
5. To determine subjective results of the experimental program.
6. To prepare reports of the results of the experimental program emphasizing problem areas and suggested student activities that disadvantaged students enjoyed.

IDENTIFICATION OF DISADVANTAGED STUDENTS

A major problem which confronted the project director and the guidance counselor at the Warsaw High School was the identification of academically disadvantaged students who would benefit from a laboratory program in applied biology and agriculture.

Interests, reading, aptitude, achievement and mental ability were assessed by the guidance counselor.

Performance in grade school

The most weight in the identification process was placed on the past performance of the students in the grade school. Eighth grade teachers were asked by the guidance counselor to identify students who learned slowly, were underachieving, lacked basic academic skills, and possessed a poor attitude toward school. In addition, records of students were examined to determine days absent, and other recorded data that revealed information helpful in identifying the academically, socially and economically disadvantaged students in the Warsaw and the Hamilton school systems. (Several disadvantaged students were transported from an adjacent school district to participate in the program.)

Tests

Several tests were administered by the guidance counselor to learn more about the students' reading ability, aptitude, achievement and mental ability. The tests used were:

1. California Reading Test
2. Differential Aptitude Test
3. Iowa Test of Educational Development
4. Iowa Tests of Basic Skills
5. Kuder Preference Record
6. Metropolitan Achievement Test
7. Otis Quick Scoring Mental Ability Test
8. SRA Achievement Series

None of the above was selected by the counselor as the one best instrument. The counselor used parts of tests for some students. The Mechanical Reasoning section of the Differential Aptitude Test was preferred for slow readers. The Otis Quick Scoring Mental Ability Test which required 30 minutes to administer was appropriate for students who would not sit still and concentrate on long tests. Because of the students' short attention span short tests or short testing periods were used. Also the tests that were used required a limited amount of reading so as to not "turn off" the slow reading student immediately.

The tester disclosed that the grade level of the tests often shown on the cover must be removed or hidden. Many students when administered a test lower than their grade level would refuse to cooperate and give true responses to the questions because they disliked performing an assignment designed for a lower grade level.

Interest Inventory

The Applied Biological and Agricultural Interest Inventory (see appendix A) was administered to all eighth grade boys and girls at Warsaw High School in the spring of each year. The inventory measured the learned interest of junior high school boys and girls toward the following areas: animals, plants, mechanics and business. Separate scores were determined for each area. In addition, a composite single score was computed from the four area scores. The raw composite scores of the students were classified into three interest groupings: scores 66 to 100, high; scores 44 to 65, middle; and scores 0 to 43, low. Students with scores between 44 and 100 were considered for the program.

The New Opportunities program used interest in applied biology and agriculture as a vehicle to motivate students. Disadvantaged students "fed up" with the traditional educational program were "turned on" by the activity oriented prevocational program.

CHARACTERISTICS AND BACKGROUND OF DISADVANTAGED YOUTH

Introduction

The disadvantaged are often concentrated in the central city slums or the rural depressed areas. Many have low family incomes and their parents have low educational attainment. In their homes books often are not available and reading is not encouraged. They have difficulty succeeding in conventional school settings and frequently are disillusioned and frustrated by the school system. Often these "slow learners" would not be successful under the traditional vocational school standards. They have a low level reading ability, limited formal vocabulary, poor speech construction and diction. The students are relatively slow at performing intellectual or verbal tasks. These students exhibit hostility and unruliness or passivity and apathy.

Work history of the parents are often characterized by unemployment or by employment in menial and dead-end jobs. They resist training because they fear their lack of experience will embarrass them. They feel that work has little value and use it only as a means of surviving.

Many disadvantaged come from substandard housing and broken homes in which there is hunger, malnutrition, unpaid debts, alcoholism or drug addiction. Homes are often overcrowded where there is no chance for privacy or personal development. These people often have no means of transportation or communication with the community. They must rely on their substandard means to exist.

CHARACTERISTICS OF STUDENTS IN NEW OPPORTUNITIES PROGRAM

The following brief sketches about selected students enrolled in the New Opportunities Program are included to give the reader an over-view of the students' home background, performance in grade school, progress in the New Opportunities Program, achievement in the current educational program and the status of students who have dropped out of school.

The names have been changed to prevent the reader from identifying the following case studies with students reported in this project.

Case No. 1

Andrew's father worked in a local factory. The family lived in a modern house with all conveniences. His father was opposed to the New Opportunities program and did not want Andrew to enroll. He considered the program to be a waste of time and stated to the project director that his boy would do better in the regular school program.

The grade school teachers encouraged the high school principal to enroll Andrew in the New Opportunities program because of his poor performance, bad conduct and negative attitude toward school. His classwork was poor because he "refused to apply the effort needed to accomplish simple assignments."

The opinion of his parents toward the New Opportunities program did not change after the first year and he was returned to the regular school program. As a result he was absent 22 days in the 10th grade and 28 in the 11th grade. In class, he became a problem student, would not participate and refused to do any work.

During the sophomore years his grades were on the borderline between passing and failing. As a junior he failed most of his courses. His teachers were of the opinion that Andrew had the ability to perform but his attitude towards school and learning involvement prevented him from achieving.

Case No. 2

Alfred's father was a factory maintenance man. He had an eighth grade education. He exhibited concern for members of his family and desired that each have the opportunity to graduate from high school. He was very happy when his son enrolled in the New Opportunities program and enthusiastically supported the director and school officials for inviting his son to enroll. Like his father, his mother also had an eighth grade education and she too, was concerned about her son's welfare. She managed an attractive home and looked after four children, all who were in school. Their home was located in town, on a very small lot which was not large enough to provide a place for their son to conduct a plant or livestock project.

Al had the inability to read. He was an under achiever in all of his subjects. Before he came into the program he was evaluated in his grade school subjects with D's and F's and was moved on to the next grade with a social promotion. His clothes were always clean, but at times he did not keep his body clean.

After he entered the program he began to read with greater comprehension and retention. His reading ability increased by two grades within one year. He took an interest in all of the activities at the land laboratory. His successful work at the land laboratory caused him to become interested in the subjects at the high school and the grades that he received reflected his effort in these classes.

Upon returning to the regular school curriculum at the end of two years, he was able to pass all of his courses without too much difficulty. His attitude had changed and he wanted to continue to try to improve his school work. His parents were staunch supporters of the program and believed their son, because of the program, now had a better chance to succeed.

Case No. 3

Bruce's parents were very interested in their son's high school education. His dad worked at a local factory while his mother stayed at home and cared for the family. Bruce's parents owned their home in town and were liked by their neighbors. The lot on which the house was located was too small to permit Bruce to conduct a school project.

He had a brother and two sisters all of whom were in school. Except for Bruce all of the children were well behaved in school. For several years in grade school he had been a problem student, his school achievement had been very low and his scores on standardized tests were low. He did seem to get along fairly well with his classmates and peers, but did not get along with his teachers. Bruce was hyperactive and could not sit still. He was constantly squirming and moving in his chair and around the room. In addition, he had a very short span of attention.

He entered the program and for a time continued to do rather strange and unusual things. He would break out giggling for no apparent reason. Some of the high school students called members of the New Opportunities program "funny farmers" and this bothered Bruce and made him unhappy. He tended to be uneasy with his teachers and frequently withdrew from classroom activity. At other times, he would talk out and made statements that showed little or no respect for others. However, as time went by, he participated more in the New Opportunities program and gained the ability to respect others and their viewpoints. He read at an average eighth grade level and enjoyed reading. He was more active when current events were discussed and would participate willingly. With a change in attitude, and it came about as he continued in the program, he was able to carry on in the regular high school program.

His parents were very satisfied with the progress their son made in the program. They expressed to the project director that they were aware of their son's change in behavior toward his brother and sisters. Both parents were especially pleased with Bruce's change in attitude toward them. He learned to confide in his parents.

Case No. 4

Frederick's father graduated from high school. He worked in a factory and lived on a farm. He provided for his large family. Frederick's mother had a part time job as a distributor for household products. She also had her high school diploma.

He had a number of brothers and sisters. All but one were older than he. One sister and one brother attended college.

Before entering the New Opportunities he had very little interest in school. He was attentive and well behaved, but showed very little interest in studying. He took part in some school activities and school affairs, but he was a very mediocre student and obtained substandard grades.

When he entered the program he was shy and bashful. Shortly, he started to take an active part in performing activities at the land laboratory. He loved farm life and wanted to become a farmer. He became an active participant in the New Opportunities program. He was no longer content to sit back and watch.

After entering the program his reading skill improved. He was very proud of the program and was never embarrassed by the comments from students regarding the program or activities in which they engaged. He wanted to continue to participate in the New Opportunities program for all four years of high school.

His parents had nothing but praise for the program. They were happy and proud of the progress made by their son.

Case No. 5

Casey's father worked at the local battery factory. His yearly income was relatively low and Casey's mother helped to meet the family's financial needs by conducting a small business. The parents did not participate in community affairs, but they were concerned about the education of their son and daughter. The family lived in a small rural dwelling with four rooms.

Before entering the New Opportunities program Casey played hooky time after time. During his freshman year he missed almost 40 days of school. He was constantly in trouble with school officials. He became a burden on his parents. He had not been able to adjust to school life.

During his one year in the program he changed from an individual with antisocial tendencies to one who could get along with his peers. He no longer made trouble for school officials and he abided by school rules.

When he left the New Opportunities program and returned to the regular school program he did not readjust to the traditional educational program. The lack of teacher attention and the emphasis upon course work was too much for Casey. He dropped out of school.

Since leaving school, he has had several jobs. He still lives with his parents and is paying for his room and board. He and the bank now own a car and his main concern is to make the monthly payments. His attitude toward people has changed. He is friendly and polite.

Case No. 6

Sampson's father was employed by a construction company as a heavy machine operator. His dad, mother and a brother lived in a comfortable, modest home located in the country. Sam had an older brother in the service. Sam and his younger brother got along with one another.

He was constantly in trouble with his grade school teachers and rebelled against traditional classroom procedure. At home he enjoyed working on mechanical equipment. He especially liked to tinker with an old car that had seen better days. Sam was convinced that it would run again.

After entering the New Opportunities program in January, he made an effort to get along with his teachers and members of the class. He "turned off" when he was not permitted to bring his car to the school shop for the repairs that were needed to make it operate. Sam stated, "School is phony and teachers are not interested in important things".

He dropped out at the end of the year.

Case No. 7

Phillip was the son of a successful business man who owned and operated a factory. His father, a high school graduate, was a self-made man. He was active in community affairs and was concerned about the welfare of his family. His mother, like his father, was very active in community affairs and social activities. His parents were community leaders.

His brothers and sisters were very active in school and in community activities. One of his sisters was a teacher and a brother was attending college. Phillip had the inability to grasp subject matter content and was classified by his teacher as a slow learner and underachiever. He was well behaved and had good manners.

After he entered the New Opportunities program he became interested in the activities in which he was engaged at the land laboratory. He liked the communications class. His attention span which had been very short, increased. He developed the ability to perform many class and laboratory activities.

Case No. 8

Michael's father and mother were nearing retirement age. They both worked in factories and their incomes were adequate to run the household. Mike's father and mother graduated from high school. The family lived in a five room house in the country. The house was located on a small lot with little land for the children to play. Mike was one of six children.

His performance in grade school was poor. School work had little meaning for him. Needless to say, he put forth very little effort. He repeated two elementary grades before his teachers started to give him a social promotion each year. During the seventh and eighth grade he frequently was absent from school.

After he entered the New Opportunities program he was able to get a part-time job and purchase a car. He constantly fought with his older brother. He also had several younger brothers and sisters at home, all of whom were academically disadvantaged.

While in the New Opportunities program his performance was excellent. He continued to miss school to work at his job and make car payments. He liked to work and his boss was satisfied with his performance.

The New Opportunities program temporarily kept him in school.

Case No. 9

Wesley's father was a successful printer. He was concerned about Wesley's education. A high school graduate with ambition and initiative, people of the community considered him to be a successful person. Wes's mother worked as a secretary. She, like her husband, was ambitious and reliable. Wes and his sister were reserved and quiet.

Before Wesley entered the program his academic achievement was low in the grade school. He was well adjusted socially and was liked by his peers and teachers. He was immature for his age and lacked confidence.

After he entered the New Opportunities program he started to achieve at an acceptable rate. He became one of the leaders of his class. He achieved at an average level but he still lacked confidence.

His parents were very happy with the success of their boy. Much of their boy's success was attributed to the New Opportunities program. The mother stated, "He now shows an interest in school and comes home and talks to us about school activities and what he has learned".

Case No. 10

Henry's father, a car salesman and a lay minister for a local church, and his mother, a full time housewife, were very concerned about their son's inability to do well in school. He lacked the initiative to go ahead on his own and perform as a student in the regular school system. Both parents enthusiastically supported the need for a special program designed to meet the needs of students who had academic difficulties like their son.

Prior to entering the New Opportunities program, Henry was not achieving in school. He was unable to get along with his teachers and classmates. His attendance was poor. He had a very low opinion of himself and the regular school program.

After he entered the New Opportunities program he seemed to have a new lease on life. He enjoyed school and came every day. About the time when he entered the New Opportunities program he landed a part-time job as a carry-out boy for a grocery store. He enjoyed working with people and demonstrated his willingness to work. He was polite to the customers. He dropped out of school during the second year of the program to join the Army. Prior to leaving for the recruiting center the class members had given him a send-off party. The Army did not accept him because of a physical condition and he was too embarrassed to return to the high school. Encouragement from his parents and the teachers of the New Opportunities program to return to school fell on deaf ears. He could not face his classmates.

Case No. 11

Steve's father was a successful farmer, an adequate provider, and a man concerned about his family's welfare.

His mother, a homemaker, spends all of her time caring for the children and helping her husband with farm chores. Steven had difficulty with reading and writing in grade school. His teachers stated that he could do the work if he wanted to, but he could not stick with a problem sufficiently long to solve it. He was not a behavioral problem in the school.

After he entered the New Opportunities program he underwent a series of tests that indicated that he was much better performing functional activities than in writing and verbally responding. He liked the program and enjoyed the curriculum. He performed at an acceptable level in all of his classes and got along well with his peers and teachers.

Case No. 12

Leonard's father was a successful, hardworking farmer. He hoped that his son would be a farmer. He participated in community affairs when he was asked. His mother had worked in a factory after her children entered high school. Of the three children in the family, two were good students. They enjoyed school and were involved in school activities. They had no trouble in school. This was not true with Leonard. He had had trouble with school starting in the elementary grades. His rate of achievement from year to year seemed to decrease and he was not prepared to enter high school.

The New Opportunities program changed his attitude toward school. He engaged in activities at the land laboratory. He responded in the communications class and readily discussed that which he was doing at the land laboratory. He developed a sense of humor and got along with his peers.

He was concerned about leaving the program because he felt that he could not succeed in the regular school program. After entering the regular program he did do acceptable work and passed his subjects. He was happy with school.

Leonard's parents had a higher level of expectation for him in the New Opportunities program. They stated to the director that a greater change should have taken place in their son.

Case No. 13

Theodore's father and mother were both concerned about his welfare. The father was a concrete worker and the mother was a homemaker. Ted was the oldest of three brothers and sisters. Before he entered the program he had a very difficult time in school. His teachers were unable to control him. He would blurt out irrelevant comments and disrupt the class. He spent three-fourths of his school time sitting in the principal's office.

After entering the New Opportunities program he was not sent to the principal's office as punishment. He gained respect for authority and his teachers respected him. He liked the activity-centered program and developed the ability to perform many skills. He enjoyed the land laboratory activities which provided an outlet for his interests and energy.

His parents became proud of him. They expressed their satisfaction with the program.

STUDENTS PARTICIPATION IN THE NEW OPPORTUNITIES PROGRAM AND PRESENT STATUS

The information in the following table shows the participation by all students enrolled in the New Opportunities program over a three year period. The present status of all students is apparent or noted. See the following page for explanation.

TABLE 1

STUDENTS	Enrolled in Program						Status end of project
	1967-68		1968-69		1969-70		
	1st sem	2nd sem	1st sem	2nd sem	1st sem	2nd sem	
1. B. Cooper (soph)	X	X	Dropped out (10/1/68)				
2. J. Dennis (soph)	X	X	Dropped out (9/15/69)				
3. J. Kopsicker (soph)	X	X					Grad
4. S. Meyer (soph)	X	X					Grad
5. J. Winkler (soph)	X	X					Grad
6. D. Wright (soph)	X	X	killed (3/10/69)				
7. T. Bloyd	X	X					Senior
8. G. Courtois		*	Dropped out (9/1/68)				
9. M. Boley	X	X	X	X			Senior
10. P. Carel	X	moved (2/1/68)		X	Moved (6/1/69)		
11. L. Courtois		*	*	Dropped out (12/23/68)			
12. B. Hufendick	X	X	X	X			Senior
13. L. Sparrow	X	X	X	X			Senior
14. G. Tripp	X	X	X	X	Moved (6/1/69)		
15. T. Huffman (soph)			*	Dropped out (11/27/68)			
16. R. Tripp			X	X	Moved (6/1/69)		
17. S. Boley			X	X	X	X	Junior
18. K. Conover			X	X	X	X	Junior
19. A. Ewing			X	X	X	X	Junior
20. J. Goodman			X	X	X	dropped out (12/1/69)	
21. V. Mewes			*	*		*	Junior
22. B. Laws						X	Soph.
23. J. Crabtree						X	Soph.
24. R. Ditto					X	X	Soph.
25. S. Griswold					X	X	Soph.
26. C. McFarland					X	X	Soph.
27. R. Morris						X	Soph.

*Tuition students

Student Enrollment, First Year of the Program, 1967-68

Twelve boys were identified for the first New Opportunities class. Six freshmen and six sophomores were enrolled. At the beginning of the second semester, a freshman dropped from the program and two freshman students transferred from an adjacent school to enter the program. Fourteen students participated in the program during the year. At the close of the 1967-68 school year thirteen boys were in the program.

Student Enrollment, Second Year of the Program, 1968-69

All boys who enrolled in the New Opportunities program the first year elected to continue in the regular school program during their junior year. Two dropped out shortly after school started.

Five of the freshmen enrolled in the first year of the New Opportunities program continued in the program for the second year.

Six freshmen and one sophomore were identified and enrolled. The total number in the program at the beginning of the second year was twelve.

Two sophomores dropped out of school at the end of the first semester. One freshman student who had dropped out at the end of the first semester during the first year returned to the program at the beginning of the second semester of the second year.

At the end of the year eleven students were enrolled.

Student Enrollment, Third Year of the Program, 1969-70

Five of the freshmen enrolled in the second year of the program continued in the program for their second year.

Four freshmen were enrolled in the third year of the program during the first semester. During the second semester two additional students were enrolled. At the end of the year, ten students were enrolled.

THE INSTRUCTIONAL STAFF

The instructional staff for the disadvantaged students in the New Opportunities program during the first year of the program were two agricultural occupations teachers and a communications or English instructor. A physical education instructor was added to the staff during the second year. During the last year of the project a mathematics instructor was also added.

Agricultural Occupations Instructors

James K. Trotter, Agricultural Occupations instructor and director of the Warsaw project in Unit #316, Warsaw, Illinois was born and reared on a farm in west central Illinois, McDonough County.

A graduate of the University of Illinois in 1964 with majors in Farm Management and Agricultural Education, he completed a Master of Education in Agricultural Education in 1965 from the same university.

He taught agricultural occupations at the Warsaw High School for five years and directed the New Opportunities Program for the last three years.

He has served as a cooperating teacher for student teachers at the University of Illinois.

Lauren Mitchell, Agricultural Occupations Instructor in Unit District No. 316, Warsaw, Illinois was born and reared in Northwestern Illinois near the Mississippi River.

A graduate of the Western Illinois University, he has done graduate work toward the Master of Education degree in Agricultural Education.

Mr. Mitchell worked in agricultural sales from 1959 through 1966. Prior to that, he had ten years of experience in retail sales with Montgomery Wards.

He taught the students in the New Opportunities program for the first two years of the program. He was especially interested in the agricultural mechanics phase of the program. In addition, he taught the students to grow plants in the greenhouse.

Larry G. Miller, Agricultural Occupations instructor in Unit District #316, Warsaw, Illinois was born and reared in western Illinois near Macomb.

A graduate of the University of Illinois in 1965, he has done graduate work at the same university toward the Master of Education Degree in Agricultural Education.

Mr. Miller worked in agricultural sales for over two years and taught agricultural occupations for one year at Wyoming High School.

For the last year, he has taught agricultural occupations and students in the New Opportunities program at Warsaw.

He will continue to teach students in the New Opportunities program at Warsaw High School during the coming year. The program now under his direction was expanded to include disadvantaged students from Hamilton, Nauvoo and Carthage high schools.

Communications Instructor

Elda J. Bartine, English teacher in Unit District #316, Warsaw, Illinois was born and reared on a farm in northeastern Missouri.

A graduate of Northeast Missouri State Teachers College in 1923, she has done graduate study in English at the University of Chicago; in guidance at the University of Missouri; in social work at the University of Pennsylvania; and in Agricultural Education at the University of Illinois.

Mrs. Bartine has taught English in Missouri high schools for fourteen years; served as Dean of Girls in Scott Senior High School, Coatesville, Pennsylvania, for three years; acted as Superintendent-in-residence of the Baptist Children's House in Philadelphia for fifteen years; taught English in Warsaw, Illinois for the last seven years.

During her years of service at Baptist Children's House, she served as case worker in the Juvenile Court for neglected, rejected, and emotionally disturbed children who were guests at Children's House, and she supervised the education of these children from kindergarten into vocational schools or colleges.

For the last three years she has taught communications in Warsaw's New Opportunities Program.

Mrs. Bartine will retire at the end of the present school year. She and her husband, a retired Baptist Minister, will live in Kingston, Tennessee. They have one son, a nuclear engineer, and four grandchildren.

Mathematics Instructor

Wes Weber, mathematics instructor in Unit District #316, Warsaw, Illinois was born and raised on a farm in southwestern Iowa near Argyle.

He graduated from Iowa State University with a degree qualifying him to teach physical education, social science and mathematics.

Mr. Weber taught mathematics, science, history and physical education at Chadwick, Illinois for three years; mathematics and geography at Oskaloosa, Iowa for three years; and geography and math at Warsaw, Illinois for the past two years.

During the past year he taught mathematics to the New Opportunities students for one period on Tuesdays, Wednesdays and Fridays.

LABORATORY AND CLASS FACILITIES

Land Laboratory

Introduction

The need for a land laboratory away from the school building was evident to the staff of the Warsaw Project. An early attempt by the project director to acquire an identified farm near the school did not materialize. Additional attempts to locate a suitable farm were unsuccessful. It was brought to the attention of the director of the project by the superintendent of the Warsaw High School that a school house owned by the school district was to be closed. After examining the school building, the playground adjacent to the building and a forest nearby, a decision was made to use the school, playground and forest in the project and call these resources the land laboratory.

Building

The building was a two room rural school located on an acre of ground next to a 14 acre woodlot. The building was located approximately four miles from the high school in the bottom land near the Mississippi River. The building contained two standard classrooms, a lavatory, and a number of small storage rooms. The building was heated with two oil furnaces. In addition, a small kitchen and two large rooms were located in the basement.

Greenhouse

Within one of the classrooms a plastic greenhouse was erected. This facility was placed adjacent to the windows on the southeast side of the building. This small room, 8 x 12, had a door at one end. Within the plastic greenhouse were benches for growing flowers and other plants.

Animal Laboratory

Pens for growing and caring for animals were located in the basement of the school building. Several stalls to house larger animals were built. Hutches for rabbits and pens for other small animals were located in the same room.

Nursery-Garden

One part of the school playground was very level. This portion of ground was approximately one-fourth acre in size. Part of this area was used to provide a fenced in lot for livestock. The balance of the ground was used for gardens and nurseries.

Forest-Woodlot

Adjacent to the school ground on high land was a woodlot containing fourteen acres of ground. The topography of this portion of ground was extremely rugged and contained a number of land forms that were of interest to the students. Two very deep ravines came down toward the river. Most of the trees were second growth. Very few good species grew in the tract of forest land. Undergrowth of shrubs provided a good cover for wildlife. Two clearings were located in the woods, both of which were very small. One of the clearings was replanted to pine trees. The other, located on the high point, provided a view of the Mississippi Valley. Growing in this clearing was native prairie grass.

Shop Laboratory

The shop laboratory was the existing agricultural shop facility at the high school. The shop 45 x 60 was well equipped. Small hand tools, power tools and welding equipment needed for project work were available for use by the students.

Communications Classroom

The communications laboratory was a standard classroom in the high school. Adequate blackboard and bulletin board space was available. Windows were located on two sides of the room. Window boxes were constructed so that plants could be grown to give the room an atmosphere to complement the applied biological and agricultural subject matter. The room was equipped with individual student desks.

Mathematics Classroom

A mathematics classroom was a standard classroom similar to the communications class facility. In addition to the standard classroom assigned to.the mathematics instructor he used the shop and the agricultural classroom from time to time when problems encountered in mathematics could be best solved in the agricultural facilities.

ADVISORY COUNCILS

Agricultural Advisory Council

The Agricultural Advisory Council at the Warsaw High School played a very important part in assisting the staff at Warsaw to develop, maintain and improve the agriculture program. The active participation of citizens from the Warsaw community was an excellent indication of the communities support for the school.

The contributions and ideas of the members of the advisory council were vital to the success of the agricultural program. The council members consisted of nine dedicated individuals from different segments of the community. The agricultural advisory council members were:

1. Mr. Norman Wollbrink, a farmer and cattle breeder.
2. Mr. Leo Jacquot, a farmer.
3. Mr. Paul Fornell, manager of the Warsaw Feed Company.
4. Mr. Elvin Brackaensick, a farmer.
5. Mr. Gary Wollbrink, a farmer, and part time factory worker.
6. Mr. Bob Kiser, a farmer.
7. Mr. Don Nagel, a farmer, and at the present time president of the council.
8. Mr. Robert Kerr, a farmer.
9. Mr. Ralph Zinn, a farmer.

During the time while the New Opportunities Program was in progress the following served as agricultural advisory council members:

1. Mr. Ned Casady, a farmer.
2. Mr. Ralph Grunewald, a farmer.
3. Mr. Terry Evans, manager of the local elevator.
4. Mr. Herb Roskamp, a farmer.
5. Mr. Emmett Schrader, a farmer.

New Opportunities Advisory Committee

The members of the New Opportunities advisory committee have been instrumental in providing a two way system of cooperation and communication between the school and the community in regards to the New Opportunity program for students with special needs. The members of the committee were:

1. Mrs. Leon Lamet, housewife to school attorney.
2. Mr. Wendell Spangler, a former superintendent of schools at Warsaw.
3. Mrs. Clarence Koehler, housewife.
4. Mr. Ed McMurray, large land owner.
5. Mr. Dean Kiser, farmer and president of the New Opportunities committee.
6. Reverend Don Hauffmeir, minister.
7. Mr. Herb Roskamp, farmer.
8. Mr. Ned Casady, farmer.
9. Mr. Glen Beeler, farmer.

INSTRUCTIONAL PROGRAM

Class Schedule

First Year (1967-68)

The first year of the program for academically disadvantaged students (see Table II) was organized so that the students went to the land laboratory in the morning after communications class, came back to the school for lunch, and returned to the land laboratory during the afternoon. The students were brought back to the high school for dismissal at 3:25 p.m. on Monday, Wednesday and Friday. The students were returned on Tuesday and Thursday at the end of the seventh period to permit several of the students to take driver training. Physical education and mathematics were taught at the land laboratory by the agricultural instructor.

TABLE II

1967-68 Schedule

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1. 8:30 9:25	COMMUNICATIONS				
2. 9:28 10:25	APPLIED BIOLOGY AND AGRICULTURE (Land Laboratory)				
3. 10:26 11:21					
4. 11:24 12:04					
5. 12:07 12:47	LUNCH				
6. 12:50 1:45	APPLIED BIOLOGY AND AGRICULTURE (Land Laboratory)				
7. 1:48 2:43					
8. 2:45 3:25		Driver Training or Shop		Driver Training or Shop	

Second Year (1968-69)

The second year of the program (see Table III) was organized so that the students went to the land laboratory at the beginning of the school day; returned to the high school for two periods of communication, one before and the other after lunch; returned to the land laboratory or remained in the high school shop until the last period of the day. The students attended driver training class during the last period on Monday and Wednesday and physical education class on Tuesday, Thursday and Friday. Students not enrolled in driver training worked on individual shop projects.

Third Year (1969-70)

The third year of the program (see Table IV) was organized to start the day with communications followed by applied biology and agriculture taught in the shop. During the third period before lunch mathematics was taught on Monday, Wednesday and Friday and physical education was taught the same period on Tuesday and Thursday. After lunch agricultural mechanics was taught in the school shop for one period before going to the land laboratory for the afternoon with the exception of Monday and Friday when the students returned to the school for driver training the last period of the day. Students not enrolled in driver education worked in the shop.

TABLE III

1968-69 Schedule

Period		Monday	Tuesday	Wednesday	Thursday	Friday
1.	8:40 :37	APPLIED BIOLOGY AND AGRICULTURE (Land Laboratory)				
2.	9:40 10:37					
3.	10:40 11:22	COMMUNICATIONS				
	11:25 11:52	LUNCH				
4.	11:55 12:37	COMMUNICATIONS				
5.	12:40 1:37	APPLIED BIOLOGY AND AGRICULTURE (Land Laboratory) (or Shop)				
6.	1:40 2:27					
7.	2:30 3:30	Driver Training	P. E.	Driver Training	P.E	P.E.

TABLE IV

1969-70 Schedule

Period		Monday	Tuesday	Wednesday	Thursday	Friday
1.	8:40 9:37	COMMUNICATIONS				
2.	9:40 10:37	APPLIED BIOLOGY AND AGRICULTURE (Shop)				
3.	10:40 11:22	MATH	P.E.	MATH	P.E.	MATH
	11:25 11:52	LUNCH				
4.	11:55 12:37	APPLIED BIOLOGY AND AGRICULTURE (Shop)				
5.	12:40 1:37	APPLIED BIOLOGY AND AGRICULTURE				
6.	1:40 2:27	(Land Laboratory)				
7.	2:30 3:30	Driver Training		Driver Training		

Course Content

Applied Biology and Agriculture

The activity-oriented curriculum content in applied biology and agriculture consisted of six major units, and were as follows: animals; plants and soil; forest, wildlife and recreation; basic mechanics and construction, leadership and human relations; and supervised experience programs. Each of the foregoing units were broken into problem areas, as follows:

A. Animals

1. Caring for the brood sow and litter.
2. Caring for the ewe and lambs.
3. Caring for pets.
4. Raising rabbits.
5. Incubating eggs.
6. Raising chicks.
7. Managing bees.
8. Collecting insects.
9. Surveying the animal enterprises in the community.
10. Determining the employment opportunities.

B. Plants and Soils

1. Producing field crops.
2. Producing vegetables.
3. Growing vegetable plants.
4. Producing Easter flowers from flower bulbs.
5. Producing geranium plants from cuttings.
6. Propagating peach trees.
7. Establishing a lawn.
8. Determining the opportunities for employment.

C. Forest, Wildlife and Recreation

1. Inventorying the forest resources.
2. Managing the standing timber.
3. Planting trees.
4. Determining land capabilities.
5. Building trails.
6. Identifying and labeling plants, tree specimens and noteworthy features of the forest laboratory.
7. Hunting.
8. Fishing.
9. Inventorying forest, wildlife and recreation resources of the community.
10. Determining the opportunities for employment.

D. Basic Mechanics and Construction

1. Building a nailbox.
2. Building a metal toolbox.
3. Building a sawhorse.
4. Building greenhouse flats.
5. Building a birdhouse.
6. Building outdoor cages for pheasants.

7. Making markers and signs.
8. Constructing a concrete floor.
9. Disassembling and reassembling a small gasoline engine.
10. Fitting hand tools.
11. Operating a farm tractor safely.
12. Framing a small building.
13. Moving a building.
14. Painting a building.
15. Servicing a farm tractor.
16. Welding, brazing and cutting metal.
17. Determining the opportunities for employment.

E. Leadership and Human Relations

1. Becoming a leader.
2. Understanding the group.
3. Developing leadership skills.
4. Identifying problems encountered by the group.
5. Developing communications skills.
6. Making the individual count.
7. Conducting organizational business in a democratic way.
8. Meeting and introducing people.

F. Supervised Experience Program

1. Conducting home projects.
2. Keeping records.
3. Borrowing and managing money.
4. Applying for a job.
5. Developing good work habits.
6. Planning for a career.

Communications

Applied biology and agriculture was used as the vehicle to motivate the students in the communications class. The instructor related the course content in communications to the daily activities of the students in the land laboratory. The communications instructor gave emphasis to three major areas: (1) speaking or discussion, (2) reading and (3) writing. The instructor gave special emphasis to the vocabulary of the students and the words that the students were encountering in the land laboratory activity were identified and defined by the students in the class.

The Purpose of Communications Class

1. To speak to be heard and understood.
2. To listen to hear and understand.
3. To write to be understood.
4. To read and understand.

The Goal of Communications Class

1. To begin each at his own level.
2. To speak to share each other's interests.
3. To listen with courtesy and to participate in discussion.
4. To improve reading comprehension and speed.
5. To write sentences, short paragraphs, and page themes legibly and literately about interests, activities, own life, and problems.

6. To widen scope of interests
   To keep alive wonder
   To awake imagination
   To know and appreciate people
7. To be aware of other means of communication

   Facial and body response
      - smile
      - frown
      - shrugs

   To use the voice for communication
      - pitch
      - tone
      - emphasis

   To know the communication of emotion
      - through music
      - through art
8. To know the importance of attitude
9. To know own image
   To have a sense of own personal value
   To recognize the worth of others
   To understand importance of being fair and of being kind
10. To build toward responsible citizenship.

Mathematics

The mathematics instructor related his classroom work to the activities that students engaged at the land laboratory. The course was problem-centered and practical problems were solved by the student. The instructor was concerned about two major areas of content in the instructional program and they were: (1) basic arithmetic and (2) solving problems. Addition, subtraction, division, and multiplication were stressed in basic arithmetic.

Innovative Procedures for the program

The following procedures which were identified by the staff members and used in the project were considered to be the innovative ideas. Few of these ideas were original but all were to be considered to be important in developing a program for students with special needs.

1. Identified academically disadvantaged students who possessed an interest in applied biology and agriculture.
2. Used students' interest in applied biology and agriculture as a vehicle to convey them into relevant educational activity.
3. Selected activities in which students would succeed.
4. Rewarded student achievement.
5. Engaged students in solving, first, the simple and concrete problems; later, the more complex and abstract problems.
6. Focused on student-teacher interaction to facilitate optimum student change.
7. De-emphasized the traditional or textbook instructional methods and developed an activity-centered program conducted in a laboratory setting.

8. Developed the students' basic skills in communications and mathematics as a part of an activity-centered program conducted at the land laboratory; the communications laboratory and the shop laboratory.
9. Introduced the student to the world of work through an occupationally oriented, activity centered program of studies.
10. Used a citizen's advisory committee to involve the community in developing an educational program for disadvantaged students.
11. Developed a program in which students identified as potential drop-outs enrolled for two years to prepare them for entrance into the regular modified school curriculum.
12. Departed from the traditional school schedule with the "New Opportunities Class" to provide an extended period of time at the land laboratory in an activity-centered program.

LEARNING ACTIVITIES AND INSTRUCTIONAL METHODS IN APPLIED BIOLOGY AND AGRICULTURE

Land Laboratory Activities

Animals

The Applied Biological and Agricultural Interest Inventory determined that most of the boys were interested in animals. Using this interest as a vehicle to promote more interest, animals were located and housed in the land laboratory building in special pens or in pens erected outside the building. A bred gilt was brought to the land laboratory after a pen had been constructed in the basement. The students built a farrowing stall and cared for the sow. Each student had an opportunity to observe the development of the sow prior to having her young and a number of boys were present when the sow farrowed.

The students had learned approved practices that would be followed at the time of a farrowing and each knew how to care for the young pigs as they were born. The mucus membrane was wiped from the nose of each pig with a burlap rag, the navel was tied off, cut and dipped in iodine, the needle teeth were clipped, and then the pigs were placed in a tub under a heat lamp until all of the pigs had been born. Later all of the small pigs were placed back with the sow so that each had an opportunity to suckle and receive the first colostrum milk. As the pigs grew they were given access to a creep feeder to provide additional feed. The students injected iron into the blood stream of the pigs to prevent pernicious anemia. Later the boar pigs were castrated and at eight weeks the pigs were sold and the sow was removed from the building.

In addition to the sow the laboratory also housed rabbits, ewes with their lambs, a groundhog, pheasants, chicks, bantam hens and roosters, and bees.

The bees were obtained from the Dadant Bee Supply in Hamilton, Illinois, and were housed in an observation hive that was installed in the classroom and had an exit through a small tube to the outside of the building. The students were able to observe the bees through the glass side of the hive.

The students incubated eggs at the land laboratory. The development of the embryo was observed from day to day by breaking an egg and then preserving the embryo in a jar.

Plants

Students actively engaged in reproducing plants sexually and asexually. Each student constructed a greenhouse flat in the shop, filled the flat with soil, and then sterilized the soil in an oven. Vegetable seeds were planted and the flats were placed in the greenhouse which had been erected inside the school building. Later plants were planted out in the garden adjacent to the building or were taken home by the students and planted in their home gardens. Fall bulbs, namely daffodils and tulips were planted in cut-down gallon containers and buried in sawdust out of doors to go through a resting process. Later they were brought in from outside and were forced in the greenhouse for Easter. The students made geranium cuttings and grew geranium plants in the greenhouse. Many house plants were donated by the parents and these too, were planted in the greenhouse.

Peach seeds were collected at canning time and brought to the school. The seeds were stratified in the fall by placing them in a sand container and subjecting them to the outdoor elements. In the spring, the seeds were moved from the sand, counted and checked for soundness and divided among the class members. The seeds were then planted in rows in the nursery. Later the trees were budded by the students.

The students engaged in a school improvement project that included the sodding of an area adjacent to a new bus garage. A sod cutter was rented by the boys and used in removing sod from land at the land laboratory. It was then transported to the school, placed and rolled.

Forest, Wildlife and Recreation

The students explored and inventoried the resources on the land laboratory early in the fall after the program was started. Trails were established that led to a lookout and a large washout. A bridge was constructed across a deep ravine and steps were made up steep banks. Brush was cut along the trail to permit guided tours of the land forest laboratory.

Elementary teachers were invited to bring their classes to the forest laboratory. The students served as guides and led the students to different points of interest and described the natural resources to the children.

Trees were planted in clear areas of the land forest laboratory. After a light snow fall the students surveyed the land forest laboratory for signs of wild animals. Parents and other interested adults were invited to the forest laboratory to observe the trails and interesting features of the forest which were appropriately identified by the students.

High School Shop Learning Activities

Basic Mechanics

Basic mechanical skills were taught to the students through the use of selected projects. Students constructed a nailbox to learn basic woodworking skills. A metal tool box served as a vehicle to teach skills related to sheet metal and cold metal work. A sawhorse enabled instructors to teach some of the advanced woodworking skills.

The students practiced to gain welding skill and then had an opportunity to show their welding proficiency by constructing a footscraper. Tool fitting and safety were taught in conjunction with the construction of the projects.

Each student disassembled and reassembled a small internal combustion engine. They learned the basic principles of an internal combustion engine.

Construction

Several buildings were constructed by the students cooperating one with another. These buildings consisted of a swine shelter, a concession stand, and a small tool shed.

Several rather large group projects were tackled by the students and their instructors. Painting and roofing the land laboratory building was the largest task undertaken and took a considerable length of time to complete.

The students constructed concrete feed troughs for hogs using a commercial form. The troughs were sold to local farmers and the money that was received over and above cost was divided among the students. The students constructed on location a concrete floor for a tool house for a community citizen.

LEARNING ACTIVITIES AND INSTRUCTIONAL METHODS IN RELATED SUBJECTS

Communications Class Activities

Speaking - Discussion

The students were encouraged to speak about and discuss the activities that they were performing at the land laboratory. The students were seated in semicircle in the room so that all students could see one another. An informal atmosphere prevailed. The instructor was very permissive and encouraged the students to speak out and state frankly their views regarding various subjects.

The inductive approach to instruction was used. A problem area was identified which concerned most of the members of the class. The class members identified goals or objectives for the problem under consideration. The next step was a listing of problems and concerns of the students which in turn were discussed and studied one at a time.

Reading

The students were encouraged to read relevant materials which would assist in answering questions and concerns that had been raised when the problem under consideration had been discussed. Printed materials developed for students with sixth grade reading level were appropriate for the class. Booklets and publications that were profusely illustrated with diagrams and photographs of the subject were especially attractive to the students. It was learned that reading materials developed for youth groups, such as 4-H, were especially applicable for use with disadvantaged students. Another reading resource, but not directly related to problems under consideration at the land laboratory, was the weekly newspaper, "You and Your World", a publication specifically designed for students with poor reading ability (see Miscellaneous Publications No. 8, page 125).

Writing

The students were encouraged to write for materials that would provide information about the problem areas under consideration. They were also encouraged to keep notes on subject material learned in applied biology and agriculture at the land laboratory.

In addition to speaking, reading and writing the students were encouraged to define words used in the problem areas at the land laboratory. A written definition of each word was developed by the students. The students were encouraged to write for printed materials. The materials were read and discussed.

Mathematics Class Activities

Basic Computational Skills

A deductive approach to learning basic computational skills was not appropriate for these students in the "New Opportunities Class." The students were not interested in learning for the sake of learning. Their needs for computational skills became apparent to them only when the approach to problem solving was used.

Problem Solving

The applied biology and agriculture instructor worked with the mathematics instructor to determine practical problems that evolved from the content of the course in applied biology and agriculture. As new problems developed the problems were presented to the students for a solution. An attempt was made to select problems that would require the use of addition, subtraction, multiplication and division. Decimals, fractions and percentages were emphasized.

INSTRUCTIONAL MATERIALS

The selection of instructional materials was based on the needs of slow learners and underachievers. These students differed from other high school students in the following:

1. Socio-economic status.
2. Level of aspiration.
3. Past educational achievement.
4. Attitude toward school, teachers and educational programs.
5. Attention span.

Students in the New Opportunities program lived in homes where reading was not encouraged. The low family income did not allow for the purchase of books. The level of student aspiration was low. The underachiever believed that book reading was performed by the school "brains". The students did not aspire to study and prepare for a job. They had not achieved, and their attitude toward school, teachers and educational programs was poor. In addition, the attention span for these students was short.

The involvement of the University staff with high school teachers at Warsaw both in the regular phone conferences and the monthly visits helped the University to become aware of the importance of identifying and locating instructional materials for students in the program. Often, during the first year of the program staff members at Warsaw complained that they had difficulty in keeping the students interested in certain problem areas. It was concluded by the teachers and the staff at the University that when "relevant" problem areas were used the students expressed a greater desire to learn and participate. The results of such experiences were utilized to plan and implement procedures to locate and identify certain publications to be used by the teachers to prepare lesson plans for relevant instruction.

Printed Instructional Aids

The inability to read was one of the characteristics of the students in the New Opportunities program and pointed out the need for criteria to serve as a guide in selecting instructional material. The criterion measures for reading materials were as follows:

1. Reading level.
2. Simplicity of format.
3. Relevance.
4. Motivating ability.
5. Cost.

Since the students were not successful in the regular school program, special emphasis was given to the activity-oriented projects. Many references were selected, evaluated and categorized into the following areas: (a) animals, (b) plants and soils, (c) forest, wildlife, and recreation, (d) basic mechanics, (e) leadership and human relations, (f) supervised experience program and (g) miscellaneous. After examining samples of publications from many sources it was concluded that printed materials by University extension offices for use by 4-H club members were most appropriate for poor readers. In addition, selected instructional units published by the Vocational Agriculture Service at the University of Illinois were appropriate for use with students at Warsaw.

Visual Aids

The visual aids consisted of filmstrips and transparencies prepared by Vocational Agriculture Service at the University of Illinois. In addition, some educational films were acquired from private agencies.

Numerous pictures were taken by the teachers in the program at Warsaw to illustrate activities in which the students were engaged. Some of these pictures were taken in black and white and were used on bulletin boards in the land laboratory. Other pictures were in color and were made into slides which were shown to the students and used for public relations.

The need for single concept motion pictures was discussed by the University and Warsaw staff and the decision was made to develop several that would illustrate the construction of several projects that are suggested in the curriculum guide of this publication. The ways and means of making single concept films was explored and was determined to be feasible. However, at this point in time the films have not been developed.

TRANSPORTATION

Transporting Students from the High School to the Land Laboratory

Three vehicles were used at different times to convey the students in the New Opportunities program to the Land Laboratory:

1. School bus.
2. Station wagon.
3. Pickup truck.

A forty-five passenger school bus provided adequate seating space for the twelve students. Entering and exiting from the bus was convenient. Students were seated at the front of the bus near the instructor who was the driver.

Conversation was carried on among the students and between the students and the instructor while in transit.

The bus was easy to keep clean and space was available for transporting tools and supplies to the Land Laboratory.

The bus was difficult to maneuver at the land laboratory. Turning around was a chore.

A nine passenger station wagon was leased to the school by a local car dealer. The rear seat was folded down to provide room for all students. The students were close to one another. Conversation among the students and between the students and the instructor was carried on without noise interference from the vehicle. The interior of the station wagon was air conditioned for summer and winter use.

The station wagon was extremely hard to keep clean and students sitting on the rear deck on wet days soiled their trousers. Entering and exiting from the station wagon for some students was difficult when compared to the bus.

A one-half ton pick up was leased to the school by a local car dealer. The students could talk and shout among themselves or at people passed on the road, but conversation between instructor-driver and students riding in the back was not possible. Generally, two students rode with the instructor in the cab and the remaining ten students seated themselves in the bed of the truck. Room was available in the bed between the students to haul tools and supplies to the land laboratory. Exiting and entering the truck was easily accomplished by the students. The teacher had concern about the tendency of the students to move to the rear of the truck where the probability of falling out of the bed increased.

The bus was used the first year of the project. During the second and third year the station wagon and pick-up received equal use.

STAFF COMMUNICATION AND COORDINATION

Warsaw High School Staff and Interaction and Coordinating Efforts

The lead agricultural occupations instructor was in charge of coordinating the efforts of the staff at Warsaw. Since his office was located in the agriculture department it was very easy for him to work closely with the second teacher of agriculture. The procedure followed was very informal and generally took place in the office at the beginning of the day. The evaluation of the project activities at the land laboratory was continuous and generally took place in the agricultural office at the close of the day.

Since the communication instructor and the mathematics instructor were located in other parts of the building somewhat remote from the agriculture department definite steps had to be taken to arrange for meetings with the total staff. An attempt was made to meet regularly for one hour each week. This meeting took place on Thursday afternoon in the agriculture department.

The students helped to keep the communication instructor and the mathematic instructor up-to-date with the activities that were underway at the land laboratory. This however, tended to be after the fact and did not permit the two instructors who were presenting related instruction to plan in advance.

The communications and mathematics instructor visited the land laboratory about once each month to observe the activities and projects in which the students were engaged. In addition, they assisted the agricultural instructors to plan and prepare for an open house in the spring of each year.

Two meetings were conducted for the total Warsaw elementary and secondary teaching staff to acquaint them with the New Opportunities Program. The teachers and administrative staff were invited to the land laboratory for an evening meeting. At this meeting the staff members had an opportunity to look at the building and facilities that had been developed. In addition, they looked at the grounds and garden projects located beside the building and finally they were guided into the forest to observe the trails that had been constructed and other activities in which the students were engaged in the forest laboratory.

A real effort was made by the project director at Warsaw and his staff to keep the teachers in the Warsaw schools informed about the program for disadvantaged students. The school newspaper had an article about the New Opportunities Program in each issue.

Warsaw High School and University of Illinois Staff Interaction and Coordinating Efforts.

A close working relationship was developed by the University of Illinois staff and the Warsaw staff. First, monthly trips were made by the staff at the University of Illinois to Warsaw to spend one full day serving as a consultant, observing the program in operation and talking with the students in the program. Second, contacts were made by the University staff with the Warsaw staff by telephone. On an average two calls were placed each week.

The need for a closer interaction between the staff at the University of Illinois and the staff at Warsaw was evident to the total staff at the end of the first year. One trip per month to the program at Warsaw by auto was not sufficient to keep the staff at the University of Illinois on top of the problems and concerns that were creating difficulty for the Warsaw staff. The telephone did not meet the need of all staff members because it was conducted on a one to one basis. A decision was made to modify phones to permit voice pickup from 8 to 10 feet and amplify the incoming message so that a conference could be conducted with staff members at each location.

The schedule and procedure for the phone conference was as follows: on Thursday at 3 o'clock each staff member at Warsaw related plans for the following week. The teachers of agriculture led by reviewing plans for conducting the program at the land laboratory. Problem areas and activities were listed, advice was solicited from the University staff and requests were made for bulletins and other instructional materials. Next the communications instructor cited what her plans were for the following week and stated how she planned to tie the assignments in discussion, reading and writing into the activities which the students were involved in at the land laboratory.

After each staff member, in turn, had made a formal presentation to inform the total staff about the content that was to be taught, the conference was then informally conducted to determine problems and concerns of individual staff members. The problems were discussed and alternatives were suggested for their solution.

Describing the behavior of the students was a topic that received considerable attention. Each day the staff at Warsaw completed a Daily Teaching Plan and Class Analysis form (pages 34-35) which had two major sections. First, the form served as a daily teaching plan. The second purpose of the form was to record the deviant behavior of each student. A line scale from 1 to 5 was used. Three was considered to be expected behavior. Behavior checked 4 or 5 was behavior better than teacher expectation. Behavior checked 1 or 2 was behavior poorer than teacher expectation. A brief statement describing the deviant behavior which was good or bad was recorded by the teacher. The telephone conference facilitated the teachers with an opportunity to compare notes and suggest courses of action that would encourage students to continue to behave better than expected. For students who deviated toward the bad side, an attempt was made by the staff to uncover the cause of the behavior. This conference lasted one hour.

A second conference was conducted on Tuesday at 3:00 P.M. The purpose of this conference was to determine how plans were going and to determine if the staff at the University of Illinois could be of service. This call was short and generally was completed within a period of fifteen minutes.

To summarize, the purpose of the phone conference was to assist the project staff to implement, coordinate and evaluate the program objectives. The procedure was as follows:

Thursday Conference

To determine -

1. The Unit and Problem Area in Applied Biology and Agriculture for the forthcoming week
2. Specific objectives
3. Activities at the land laboratory
4. Teaching procedure planned
5. References and teaching aids to be used

Tuesday Conference

To determine -

1. Accomplishments and results of the last week
2. Innovative ideas used
3. Problems and concerns
4. Recommendations

EVALUATION

Instructional Staff

The instructional staff consisted of two agricultural occupations instructors, one English instructor and a mathematics instructor. All members of the staff worked together and were concerned about the students enrolled in the New Opportunities program.

Agricultural occupations instructor

The education of agricultural occupations instructors prepares them to teach applied biology, agriculture and mechanics. The instructors were qualified to teach about animals, plants, mechanics, forestry, leadership and supervised experiences program. The teachers were acquainted with the school area and made use of the resources of the community.

WARSAW NEW OPPORTUNITY CLASS
DAILY TEACHING PLAN AND CLASS ANALYSIS

Teacher________________________

Land Laboratory__________
Communications__________
Mathematics__________

Date________/________/________
Month Day Year

Major Unit Problem area, objectives	Procedure-technique Instructional aids

	Behavior Evaluation				
	Good		Ave.	Poor	
	5	4	3	2	1
1. Bloyd, Tommy					
2. Boley, Mike					
3. Carel, Paul					
4. Cooper, Bill					
5. Dennis, John					
6. Hufendick, Robert					
7. Kopsicker, John					
8. Meyer, Steve					
9. Sparrow, Larry					
10. Tripp, Gary					
11. Winkler, Jack					
12. Wright, Dick					

Explain deviant behavior on right

EXPLANATION OF DEVIANT BEHAVIOR

Student's Number

Revisions and Comments on Lesson(s)

The agricultural occupations instructors found that disadvantaged students liked to engage in many areas taught in the regular agriculture program. The teachers had to depart from the regular academic approach to instruction and develop an activity-oriented program.

English or communications instructor

The Communications instructor was an outstanding teacher who taught students first and subject matter second. She was able to relate reading, writing and speaking to the activities in which the boys were involved at the land laboratory.

She was firm, but friendly and challenged the students to do their best. "I can't" were nasty words in her classroom. She had a remarkable way of stimulating students to be active and participate. Her interest in all students, especially the academically disadvantaged, well qualified her for the instructional role given her in the New Opportunities program.

Mathematics instructor

The mathematics instructor taught the New Opportunities students three periods each week the last year of the project. Mathematical problems stemming from the land laboratory activities were brought into the classroom to be solved.

The instructor's interest in the students qualified him to serve as their instructor. He had the ability to focus on the major problem and have the students perform basic mathematics in addition, subtraction, multiplication and division. To use another approach would have "turned off" the students.

Ancillary personnel

The guidance counselor and reading specialist were very active in the program. Both men worked closely with the project director.

The guidance counselor assisted in identifying students for the program. In addition, he tested and counseled each boy.

The reading specialist worked closely with the communications instructor and suggested resources and procedures that could be used with poor readers.

Students

Twenty-seven students were enrolled in the program. All were slow learners and underachievers. Many were antisocial and their attitudes toward school, teachers and learning activities were poor. None of the students were happy with school and many planned to drop out of school. Failure in course work would cause nearly all to discontinue their formal education.

Change in behavior

The New Opportunities program attempted to change the attitudes of students by using as a vehicle, interest possessed by students in applied biology and agriculture taught at a land laboratory. How did the students respond to the program?

Interest

All of the students liked the activity-centered program conducted at the land laboratory. Each student was interested in one or more of the many instructional areas included in the program. Some liked animals, others plants, while still other students enjoyed the forest. For many, mechanics was the best area. Not all students participated at first, but they did participate as their attitudes changed.

Attitude

Most of the students did not like school or teachers. As they worked closely, side by side, with the agricultural occupations instructors doing jobs at the land laboratory their attitude toward teachers changed. The communications instructor showed a genuine interest in each student and related instruction in reading, writing, and speaking to the instruction program at the land laboratory.

Performance

The performance of most students improved as they became involved in relevant activity. Praise was given for good performance. Criticism was withheld. Instructors were very permissive, depending upon reward to channel students toward avenues of acceptable behavior.

Occupational outlook

Each student was encouraged to think about the "World of Work" and select an occupational area in which he would look for work. The communications instructor encouraged the students to read about job opportunities. The boys analyzed jobs that were held by friends to determine training needed to enter the employment, pay and opportunity for advancement.

Academic progress

As the attitude of students changed they were more likely to be accepted by their subject matter teachers as they entered the regular school program. Students who had been in the New Opportunities program were more visible to the academic teachers and received more attention which in turn motivated the student to try harder. Students who wanted to graduate were able to meet the academic requirements of regular courses.

Functional Aspects of the Land Laboratory

An elementary school building, one acre of land and an adjoining fourteen acre tract of timber comprised the land laboratory. Within the interior of the building a small plastic greenhouse had been erected. Pens and cages for animals were located in the basement of the building.

Instructional adequacy

The total complex permitted the instructor to teach the problem areas in applied biology and agriculture. The agricultural occupations instructors would have rated the land laboratory as adequate for instructional purposes with the following changes:

1. Erection of a small barn for farm animals.
2. Erection of a greenhouse adjacent to the building.

With the large animals in the building, the odor from manure was objectionable. Natural light was limited by the small basement windows and the ventilation was poor.

Very little natural sunlight came into the plastic greenhouse located in the building adjacent to the windows. Artificial light was supplied, but proved to be unsatisfactory.

Teacher satisfaction

The teachers were generally satisfied with the functional aspects of the land laboratory. All of the problem areas identified for the course of instruction could be taught by having students engaged in activities within the building, on the acre of ground upon which the building was located, or in the forest adjacent to the school grounds.

At times, the distance of four miles between the High School and the Land Laboratory was a problem, especially during the winter when the snow made traveling difficult and in the spring when the Mississippi River rose to the flood stage.

Care of the livestock on weekends was a chore that was done by teachers and students. Needless to say, the teachers or an adult had to supervise the work of the boys and trips to the Land Laboratory was made every Saturday and Sunday during the year. Several members of the advisory council assisted with the chores.

Student satisfaction

The students were satisfied with the Land Laboratory. They enjoyed the activity-centered program at the laboratory. Each student felt that he had a part in developing the laboratory into an attractive place, where they could do that which they liked.

The parents reflected their sons' interest in the laboratory by expressing to the instructors satisfaction in their sons' improved attitudes toward school, teachers and learning.

The Instructional Units

The instructional units were as follows:

1. Animals
2. Plants and Soil
3. Forest, Wildlife and Recreation
4. Basic Mechanics and Construction
5. Leadership and Human Relations
6. Supervised Experience Programs

The Applied Biological and Agricultural Interest Inventory which had been administered to all boys in the eighth grades showed that New Opportunities students were interested in one or more of the following areas: Animals, plants and mechanics. The students accepted all of the units of instruction. Their interest was used as an instructional vehicle.

The units were divided into problem areas which in turn were taught using the problem solving approach. The students performed at their best when actively involved in doing.

The entire land laboratory was an instructional aid. An attempt was made to always use "real problems".

SUMMARY

Twenty-seven boys were selected to participate in the program over three years. The project was named the "New Opportunities" program by the administration and teachers involved in the project. It was anticipated that without a name the class would be labeled by students and faculty members. With the use of the Applied Biological and Agricultural Interest Inventory, interest in animals, plants, mechanics and outdoor activities was determined to be present for all boys. All of the boys were identified by the guidance counselor as underachievers based upon their below average performance in former courses. Many of the boys had a history of poor attendance. In general, their attitude toward the school and their teachers was poor.

An attractive four-room rural school building located on one acre of ground which was next to a 14-acre woodlot was chosen to serve as the land laboratory. Two of the four rooms were in the basement. The building was located approximately four miles from the high school in the bottomland near the Mississippi River. The woodlot was on high ground permitting a spectacular view of the valley.

Four staff members were involved part-time with the project. In addition, the guidance counselor and a reading specialist assisted as a part of their regular school duties.

The curriculum content was as follows:

1. Applied biology and agriculture
   a. Animals
   b. Plants and Soils
   c. Basic Mechanics and Construction
   d. Forestry, Wildlife, Recreation and Conservation
   e. Leadership and Human Relations
   f. Supervised Experience Program
2. Mathematics and finance control
   a. Computational Skills
   b. Problem Solving
3. Communications
   a. Listening
   b. Speaking
   c. Writing
   d. Reading
   e. Human Relations
4. Physical education

Applied biological and agriculture were taught at the land laboratory by the teachers of agricultural occupations for three hours each day. Transportation of the students to the laboratory was by bus, station wagon, or truck driven by either teacher.

Communications was taught at the high school building for one hour each day. The instructor's experience in working with youngsters with special needs in the Philadelphia area of Pennsylvania enabled her, through her instructional program, to acquire the respect and admiration of most of her twenty-seven boys.

The course content at the land laboratory was developed around the six highly visible areas identified under curriculum content.

The students participating in the program were intensely interested in these major areas and thoroughly enjoyed the activities that make up the course content.

Each of the boys in the program had to have an opportunity to demonstrate that he could achieve and be successful, but first he had to become involved in some learning activity that he would accept, enjoy and be assured that he could accomplish something worthwhile. At the land laboratory he performed many learning tasks. For this, he received praise and was encouraged to continue to be actively involved in other learning activities. Certainly, one of the major concerns of those involved in conducting the project was to make it possible for the student to develop a backlog of successful experiences to cope with years of failure and frustration encountered in a traditional program that had permitted failure to beget failure until the boys felt that no one cared.

The key to adjustment was enjoyable, purposeful activity that facilitated, on the part of the students, accomplishment and the desire to continue in additional activities.

One of the major duties of the staff members from the University of Illinois engaged in the project was to assist the Warsaw teachers in identifying activities in which the student would want to become involved.

Learning activities center around the rabbits, chickens, pheasants, brood sow and litter, sheep, and ground hog kept at the land laboratory. In addition, flowers were grown in the classroom. Bees were studied in an observation hive. Nature trails were located in the woodlot and the students served as guides for elementary children to explain interesting land forms and show off their plot of native prairie grass. In the shop, practical projects were constructed to learn basic skills.

There was time for fishing in the Mississippi River. The fish were prepared and served in the land laboratory kitchen. All were urged to join the FFA and participate in the leadership activities.

The communications instructor skillfully wove into the interesting activities, in which the boys were engaged, her lessons on communication or speaking, writing, reading and listening.

Mathematics and computations were integrated with the course content at the land laboratory.

ACCOMPLISHMENTS

Students who were slow learners, underachievers, and potential dropouts were identified. Most of the students were interested in applied biology and agriculture and were receptive to an activity oriented program conducted at a land laboratory or in the shop. A land laboratory was located and developed. Four teachers were welded into a team which worked together planning for their respective classes taught at the land laboratory, the shop and in the communications and mathematics classroom. A strong liaison was developed between the University and the Warsaw schools. An activity centered program was developed at the land laboratory.

The most gratifying accomplishments of all, were those that related to change in student behavior. To enumerate:

1. The attendance of nearly every student improved.
2. A change in attitude was evident when the daily evaluation forms completed by the teachers were examined.
3. Standardized tests indicated improvement in the reading level of each student. Many advanced more than one year in less than a year.
4. The students spoke and wrote more effectively.
5. Many of the students improved their self image. They had a feeling of personal worth.
6. The students' attitude toward learning and learning involvement substantially improved.
7. The students demonstrated their interest and ability to perform successfully in supervised individual projects at the land laboratory.
8. It was evident to the instructional staff that the students had an interest in regular school courses and were concerned with the necessity for preparing to enter the world of work.

Instructional approach

The approach to instruction was problem solving. The inductive approach to teaching which involved the student in identifying real problems which needed to be resolved at the land laboratory, in the school shop, and in the communications and mathematics classrooms was used. The approach to problem solving was as follows:

1. Identify a problem area in which students show an interest.
2. List objectives (What do we hope to accomplish?)
3. List problems (What do I need to know or be able to do to accomplish my objectives?)
4. Arrange problems or questions in the order that each will be considered.
5. Select the first problem.
6. Discuss what is known.
7. Collect additional data
    a. Resource people
    b. Printed material
    c. Field trip
    d. Others
8. Try a trial solution.
9. Evaluate (accept or reject solution).
10. If solution is rejected, collect more data and try again.
11. Arrive at solution.
12. Perform activity using approved practices from the solution to the problem.

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PART II

A CURRICULUM GUIDE

48/49

SUGGESTIONS FOR DEVELOPING A PROGRAM FOR RURAL DISADVANTAGED YOUTH

It was demonstrated in the Warsaw project that many activities stemming from course content in Applied Biology and Agriculture were liked by disadvantaged students who possessed interest in animals, plants and mechanics. The students especially enjoyed doing activities in a real setting. Potential drop outs changed their attitude toward school, teachers and learning activity in a land laboratory setting.

The following pages of this report have been written to assist administrators and teachers to develop a program for the academically disadvantaged students who respond favorably toward applied biology, agriculture and mechanics.

The Instructional Staff

Applied Biology and Agriculture Occupations Instructors

The responsibility for meeting the needs of academically disadvantaged youth interested in animals, plants and agriculture should be assumed by the agricultural occupations instructor. His experience and educational background has prepared him to make the first steps toward providing an educational program to meet the needs of selected students.

Communications of English Instructor

A communications instructor with experience in working with students with reading and writing difficulties should be a member of the staff assigned to work with selected academically disadvantaged students. Above all, the teacher should have an empathy for slow learners and underachievers and a real desire to want to help these students. A rural background would be helpful.

Mathematics Instructor

A mathematics instructor should be added to the instructional team who has the same characteristics as those described for the Communications instructor.

Ancillary Personnel

The guidance counselor, reading specialist and school psychologist should be actively involved with program development and identification of disadvantaged students. In addition, the principal, curriculum coordinator, and superintendent should be well informed and involved in coordinating all facets of the educational program for the disadvantaged. Emphasis by administrators should be given to conducting the program as a regular program without drawing attention to a "special program".

The Instructional Facilities

Land Laboratory

The land laboratory is highly recommended for students interested in applied biology and agriculture. The laboratory should not be limited to the use of one special group. The use of the laboratory is especially appropriate for all students in the agriculture department. In addition, biology classes and elementary classes can make good use of the forest. The following is recommended:

1. Buildings should be located at the site of the land laboratory to provide for the following:
    a. Classroom instruction
    b. Storage
    c. Animal housing
    d. Plant growing (greenhouse)
    e. Rest rooms

The greenhouse (plastic) could be located adjacent to the high school. A small farm with dwelling and outbuildings is highly recommended.

2. Tillable land should be in proximity with the building. One to ten or more acres are needed depending upon the field crops to be grown. One acre is needed for garden plots, plant nursery, and demonstration plots.

3. Woodlot or forest land should be close to the land laboratory building. A ten acre tract divided into ten one acre blocks would allow for a ten year plan to be completed by managing one acre each year.

Selection of Students

Interest Inventory

The Applied Biological and Agricultural Interest Inventory published by Interstate Printers and Publishers, Danville, Illinois, should be administered to eighth grade students in January to determine students' learned interest in animals, plants, mechanics and business. Academically disadvantaged students with an interest in these areas should be considered for the program.

School records and personal data

1. Survey eighth grade teachers of the school district to determine students who have poor attitudes toward school, are underachieving, and plan to drop out.

2. A data form should be developed by the guidance counselor to record information about the students' performance in school, capacity to learn, interests, home situation and other descriptive data.

Enlisting the Support of the Parents

A letter should be sent by the high school principal to parents of academically disadvantaged students to announce the high score on the Applied Biological and Agricultural Interest Inventory. This letter carrying good news invites parents to a meeting at the school to discuss their sons' future. The meeting should be planned to talk about career opportunities in applied biology and agriculture and a course of instruction in applied biology and agriculture, communications, mathematics that will start their son toward a good job. The guidance counselor, agricultural occupations instructors, communications instructor, mathematics instructor should all participate in the program.

The staff should make personal visits to homes of prospective students.

Advisory Council

A citizen's advisory council is recommended for the agriculture department. This well informed group helps to keep the community informed.

The Instructional Program

The education program for disadvantaged students should not be a "special" program and identified as such for all people to know. Instead, the program should be designed like all good courses and programs to meet the needs of enrolled students.

In order to remove the stigma attached to a program for disadvantaged students an attempt should be made by the school administration and staff to blend the program into the curriculum offerings of the school.

Applied Biology and Agriculture, and Supportive Courses

The program for disadvantaged students with an interest in applied biology and agriculture can be implemented by the staff of the agriculture department and supportive staff of the high school. The following recommendations should be implemented in a two teacher agriculture department.

The first year schedule of classes in applied biology and agriculture for the disadvantaged students would be as follows:

1. Mix the disadvantaged students with the first year students in applied biology and agriculture to study for one period each day in the high school agricultural classroom or shop.
2. Conduct a class with the disadvantaged students at the land laboratory for two or three periods each day.
3. Provide a separate class in communications for one period each day.
4. Provide a separate class in mathematics for one period each day.
5. Integrate disadvantaged students with regular physical education classes.

The second year schedule would be similar to the first. An alternative for communications and mathematics the second year would be to mix the disadvantaged students with lower ability students.

The students would be returned to the regular school schedule for their junior year.

Planning For Instruction

The following pages are included to help the instructors of the program plan the instructional content.

The Instructional Guide on pages 74 and 75 illustrate how the applied biological and agriculture instructor, the communications instructor and the mathematics instructor coordinate the class instruction with the problem area, "caring for a brood sow and litter".

Suggested Procedure For Teaching A Problem Area

The instructor must provide the leadership in organizing the instructional procedure for a problem area to ensure that each student will be successful in accomplishing the student objectives that have been identified. The organization of the teaching procedures into a logical sequence of activities that evolves from those that are quite simple to the more complex is of primary concern to the instructor.

The following problem area, "constructing a wooden nail box," has been selected to serve as an example to illustrate the sequential procedure for helping the students to develop basic woodworking skills. This is a teacher guide and is not intended for student use.

Problem Areas in Basic Mechanics and Construction

PROBLEM AREA NO. 1: Constructing a Wooden Nail Box.

Objectives: Develop the knowledge and ability of students to:

1. Know and understand the information provided on a plan.
2. Draw a working plan.
3. Select the lumber for the various parts.
4. Calculate a bill of materials.
5. Select and use properly the appropriate tools for each operation.
6. Rip to width.
7. Measure, mark, square and cut to length.
8. Work the wood to the line.
9. Personalize the project.
10. Finish the project.

Teacher Preparation:

1. Become familiar with plan.
2. Select lumber to be used for each part.
3. Determine buying and assemble bills of materials to have when discussion comes up later with class.
4. Check all the equipment to be used, making sure it is sharp and in proper working order.
5. Locate student work stations in shop.

Equipment and Materials

Equipment

Ruler
Straight edge
Sharp #3 pencil
Framing square
Tilting Arbor or radial arm saw
Cross-cut saw
Jack plane
Block plane
Brace and #16 bit
Key-hole saw
Jointer-planer
Letter imprint stamps
Paint brush
Hammer
Wooden hand-screw clamp
Nail set
Screwdriver

Materials

Lumber
Nails #4 box and #4 finish
Glue (optional)
Screws (optional)
Sand paper (fine and medium)
Paint
Wood filler

Problem No. 1. Studying the plan and making working drawings.

Objectives: Develop the knowledge and ability of the student to:

1. Gain a perspective of the job.
2. Determine the thickness, width and length of each part.
3. Draw an orthographic projection showing the top, front, and right side views.
4. Develop an assembly bill of materials.
5. Determine what lumber to use to get parts with these dimensions.
6. Make a buying bill of materials.
7. Order material from the lumber yard.

Procedural Steps:

1. Read the job sheet on blueprint of the nail box to determine the overall dimensions of the nail box.
2. Read the blueprints to determine how the parts fit together.
3. Read the job sheet or blueprint to determine the thickness, width and length of each part.
4. Instruct students how to correctly write the dimensions of a board. Use the following order - thickness, width and length.
5. Prepare a bill of materials by making a list of all items needed in a chart with the following headings: quantity, dimensions, kind of wood and use.
6. Determine what lumber to use.
7. Total the length of all the required lumber with like thickness and width to give the linear feet of that board required. Use the following headings: quantity, dimensions and kinds of wood.
8. Include in the buying "bill of materials" the nails, screws or other hardware needed for the project.
9. Take the "Buying Bill of Materials" to the lumber yard and order your lumber and hardware.

Problem No. 2: Making the handle for the nail box.

Objectives: Develop the knowledge and ability of the student to:

1. Determine the dimensions - thickness, width and length.
2. Select the lumber to use.
3. Select and use properly the appropriate tool for each operation.
4. Rip to width with the power saw.
5. Measure, mark and cut to length.
6. Plane or sand to the line.
7. Lay out the handle on both sides of the board (use pencil).
8. Remove unwanted wood by drilling and sawing.
9. Personalize.
10. Give handle light sanding.

Procedural Steps:

1. Using the assembly and buying bills of material, select the lumber to use for the handle.
2. Consider the operations to be performed on the handle and determine what equipment will be used.
3. Using the tilting arbor or radial arm saw, rip the board to width leaving not over 1/8 inch to be removed with the plane.
4. Always place the surfaced or smooth edge of the board against the fence when sawing.

5. Always use a sharp #3 pencil when marking the lumber of laying out the handle.
6. Select lumber for the handle free of knots in areas which will be cut, drilled or nailed.
7. If a table saw is used to rip the lumber, adjust the blade so that no more than 1/4 inch above the board. Also make sure that all guards are in place and working properly. The same goes for the shields on the radial arm saw if it is used.
8. Always wear goggles when sawing and keep your eyes on the area where the blade is cutting.
9. Check the squareness of one end of the handle stock using the shoulder square on the tri-level square. If square, proceed to step 11, if not, go on to step 10.
10. Use the square and pencil draw a line across the face of the board. Mark this line down the edge of the board across the other face and up the second edge. Carefully saw along these lines.
11. With the blade of the framing square flush against the smooth side of the board and the tongue on the face, locate the number on the inside of the blade which is the length of the handle (e.g. 15 inches) even with the end of the board. Draw a line across the face of the board along the inside of the tongue of square. Use the small square to encircle the board with a line at this point.
12. Use a fine toothed crosscut saw to carefully cut along the outside of the line. If a block plant is to be used to work to the line, cut about 1/16 inch from the line then plane down. The line encircling the board will indicate how far to plane down.
13. Mark off the correct width of the handle by placing a shoulder or tri-square along the smooth edge. Measure over the correct distance and draw a line along the face at this point. Repeat for the other face.
14. Place the handle in a bench vise (using scrap boards as protectors) with the width line closest to the top. Tighten the vise securely.
15. Remove the excess wood by planing to the lines. The jack or fore plane should be used for this operation. The worked edge should from now on be considered the top of the handle.
16. Place the handle on the table with one side up. Using a ruler locate the middle of the board (lengthwise). Use the square and mark a line perpendicular through the middle. Always work from this line.
17. Use the square to measure and mark a line parallel to the bottom 2 3/4 inches from it. (Inside depth of box could be different, get correct distance from drawing.)
18. Measure and mark points 1 1/2 inches each side of the middle line. (Step 17). Use the square to line through these points parallel to middle line.

2

19. Use the square to draw a line parallel to the top 1 1/2 inches from it. This line should extend 1/2 inch beyond each of the vertical lines drawn in step 19. Use a center punch to locate these points for future reference.

20. Turn the board over and repeat the last 2 steps.

21. Locate and mark points along top edge of handle 2 inches each side of the middle line. Measure up from the bottom corners 2 3/4 inches (inside depth) do this for both ends. Using the straight edge draw a line connecting each of these points with the point closest to it on the top edge.

22. Turn the board over and repeat on the other side.

23. In sawing the handle, carefully saw along pencil lines about 1/8 inch to the outside. Start the saw cut on the end of the handle and be sure to hold the saw perpendicular to the surface.

24. Secure the handle in the bench vise and use a jack on fore plane to remove the excess wood down to the line. Plane down the slope which is with the grain.

25. You are now ready to drill the holes to start the handhold in the handle. For this you need the brace and #16 bit.

26. Fasten the board securely in the vise again. Place the tip of the bit in the outer punched holes from step #20.

27. When you are sure the bit is perpendicular to the board begin turning the brace. Use a square and sighting with the eye to get the bit perpendicular.

28. Drill until the tip just protrudes through the board. Turn the brace backwards and remove the bit.

29. Place the tip of the bit in the other punch mark and repeat steps 27 and 28.

30. Remove the board from the vise, turn it around and reclamp it.

31. Place the tip of the bit in the hole it made when working from the other side. Turn the brace carefully until the wood is removed. Repeat for the other hole.

32. Use the straight edge and pencil to draw lines connecting the bottoms and tops of the holes just drilled. Do this on both sides of the board.

33. Remove the wood from between the two 1 inch holes by using a key hole saw. Saw about 1/16 of an inch inside of the line.

34. Use a fine toothed wood rasp to smooth out the inside of the handhold down to the lines.

35. Adjust the combination square so that 1/16 inch extends out the end. Use this to draw 4 lines along the top edge of the handle. These lines should be located 1/16 inch from corners on both sides of the board and the top edge.

36. Draw a line 1/16 of an inch away from the handhold on both faces of the handle.

37. Plane an angle on the top corner of the handle down to the chamfer lines. Do this with the jack plane.

38. Use the fine toothed wood rasp to chamfer the handhold.

39. Use an alphabet imprint stamp set to place the name of each student on his handle. The name should be located on the flat part of the top edge. (Above the handhold.)

40. Sand the handle lightly to remove the pencil markings. Use medium sandpaper followed by fine paper. Do not sand the bottom edge and ends.

41. Measure and mark points 4 1/4 inches from both ends, do on one side only. With the square locate and draw lines 2 3/4 inches high through these points and perpendicular to the bottom edge.

Problem Area No. 3: Making and assembling the bottom and dividers.

Objectives: Develop the knowledge and ability of the students to:

Determine the dimension.
Select the lumber to use.
Select and use properly the correct tool for each operation.
Measure, mark and cut.
Plane or sand to the line.
Give light overall sanding.
Assemble parts correctly.

Procedural steps:

1. Use the assembly and buying bills of materials to select the lumber to use for the bottom.
2. Consider the operations to be performed for this problem and determine what equipment will be needed.
3. Use the framing square to check the squareness of a corner of the plywood. If square go on to next step. If not, draw lines on plywood to indicate a square corner.
4. Use the square to lay out the bottom. It should measure 9" x 14 3/4" (the same length as the handle). Get the exact dimensions from the working drawing. To do this, place the 9 inch mark on the inside of the tongue at one edge of the plywood, place the 14 3/4 (or correct size). Read on the inside of the blade at the other edge of the plywood. Work along the inside of the square.
5. Use the hand rip saw to cut the bottom from the stock material. Again the cut can be made about 1/16 inch from the line and then the wood removed to the line with a sharp plane.
6. Saw the plywood with the good or best side up, because this is how it will be placed in the tool box.
7. After sawing again for squareness of the bottom board, then lightly sand the top side of the plywood.

8. Turn the bottom sanded side down, draw 2 corner to corner diagonal lines to locate the center of the bottom. Use the square to draw a line lengthwise of board through the point where the two lines cross.

9. Drive a 6 box nail straight into the board at the point where the lines cross. Drive the nail until just before it breaks through. Place a piece of scrap lumber under the bottom to protect the table in case the nail goes too far through.

10. Fasten the handle securely in the bench vise with the bottom over the handle using the center line as a guide. Drive in the nail the remainder of the way.

11. Check to make sure the handle and bottom are square, then drive a nail through the bottom into the handle.

12. This nail should be driven in pointing at a slight angle toward the center.

13. Drive another nail at the opposite end of the line, in the same manner as before.

14. Drive one more nail located midway between the center nail and each outer nail. These nails should be driven at a slight angle toward the outer end of the handle.

15. Use the assembly and buying bills of material to determine the lumber stock to use for the dividers.

16. Use the jointer planer to work the 1 inch boards down to 1/2 inch thick, if 1/2 inch boards cannot be obtained. One-half inch plywood can be used for the dividers, sides and ends but the layered open side grain of plywood does not give as neat a finished product as solid lumber.

17. The buying of materials included a 1" x 6" board. After it has been planed to 1/2 inch thick rip it down the middle. Use the power saw for this.

18. Measure, mark, square and saw the two boards for dividers. These should be 4 1/18 inches long, but the distance from the handle to the edge of the bottom should be measured to get the exact length.

19. Always saw the first board off before measuring and squaring the second or make the second one about 1/8 inch longer.

20. Sand the dividers lightly.

21. Turn the handle and bottom so that the divider guide lines on the handle are toward you.

22. Measure in from end of the bottom 4 1/4 inches and mark this point. Use the square to draw a line from the edge to the handle. This line should match the one already on the handle. If not, correct one line so they match evenly.

23. Turn the bottom and handle to where the divider lines are away from you. On this side of the handle measure and mark a very light line 4 1/2 inches from each end.

24. Turn the bottom upside down and draw lines across the bottom 4 1/2 inches from the ends.

25. Stand the base on edge so the divider guide marks are down. Position one divider in its proper location.

26. Using the nailing line as a guide drive two 4d finish nails through the handle into the divider. Repeat this procedure for the other divider.

27. Turn the assembly over letting the handle hand over the edge of the work table so everything rests on the dividers.

28. Using the line on the bottom as a guide drive two 4d nails to secure one divider to the bottom. Repeat this procedure for the other divider.

29. Turn the assembly right side up and measure to see if the dividers extend beyond the outer edge of the bottom. If everything was done correctly, they should not.

30. If they do use the square to mark a line on the divider even with the edge. Use a sharp block plane to remove the excess wood down to the line. Caution must be exercised when planing so that dividers are not loosened. The wooden handscrew clamp could again be used to hold the dividers to the bottom.

Problem Area No. 4: Making and assembling the ends and sides.

Objectives: Develop the knowledge and ability of the student to:

Determine the dimension.
Select the lumber to use.
Select and use properly the correct tool for each operation.
Measure, mark, square, and cut.
Plane or sand to the line.
Sand lightly overall.
Assemble parts correctly.

Procedural steps:

1. Use the assembly and buying bills of material to select the lumber stock for the end and sides.

2. The 1' x 4" board should have been selected to use for the end and sides.

3. Since the board is about 3/4 inch thick it should, like the dividers, be run through jointer-planer to make it only 1/2 inch thick.

4. Measure the width of the bottom, it should be nine inches. If not, cut the end boards to the actual width.

5. Measure, mark, square, and cut one piece from the end and side stock which has been planed. This piece should be 9 inches long or whatever the width of the bottom was when measured. Always check the squareness of the end of a board before measuring it, as was done for the handle.

6. After the board is correct length, use the tri-square to draw a line 3 1/2 inches from the bottom of the edge board just cut. Draw this line on both faces of the board.

7. Secure the end board in the bench vise and use the jack or fore plane to remove the excess wood down to the line. Sand the end board lightly.
8. Repeat steps 4-7 with another piece of the 1/2" x 4" stock to be used as the other end board.
9. Stand the handle and bottom assembly on one end. Center one of the end boards into position on the upright end of the assembly.
10. Carefully drive a 6d finish nail straight into the end board 1/8 inch from worked edge and 4 1/2 inches from one end.
11. Drive a nail 3/8 inch up but closer to each end. These nails should be driven at a slight angle toward the center of the bottom board.
12. Drive another nail about 3/8 inch up and halfway between the center nail and each end nail. Drive two more finish nails through the end board into the handle.
13. Turn the assembly over and repeat steps 9 to 12.
14. The sides are cut from the same stock as the ends.
15. Remember the sides must cover the entire length of the nail box including the end boards. Measure the overall length now to obtain the exact measurement to use when cutting off the sides. This should be about 16 inches which is what will be used in this procedure.
16. Measure, mark and square a line 16 inches from the squared end of the stock material. Make the mark on both sides of the board.
17. Saw about 1/8 inch outside this line and plane down to it for better fit if students are inexperienced at sawing.
18. Use the tri-square to draw a line on each side of the board 3 1/2 inches from one edge. Use a jack or fore plane to remove the excess wood down to the lines. Sand the board lightly.
19. Repeat steps 15 to 18 to make the other side board.
20. Turn the box on one side so that the dividers will be up. Position a side board on the upright part.
21. The lengthwise position is with the ends flush with the outside corners of the end boards. If too long, mark square and plane off more.
22. The up and down position is with the worked edge flush with the bottom and the top edge flush with the top corners of the end boards. If the board is too wide align the top corners while nailing, then plane down after it is assembled.
23. After the side is in the correct position drive a 6d nail in the middle of it 3/8 inch from the worked edge.
24. As with the end boards drive the 6d nails located close to the ends of the side board at an angle toward the center.
25. For the side boards, drive 2 nails between the end nails and the center one.

26. Drive two 6d nails through the side board into the end boards. Two 4d nails should be driven through the side board into the dividers to secure them.
27. Turn the assembly over and repeat steps 20-26 except for nailing the dividers because there are none on that side.
28. Use the hammer and nail set to set each of the finish nails properly into the wood.
29. The next step is to mark the chamfer guide lines.
30. Adjust a tri-square to where you can mark down the side and across the edge 1/4 inch. This should be done all around the top and outside edge.
31. Tilt the assembled box over and repeat step 29 around the bottom outside edge of the box.
32. Secure the box in the bench vise and use the jack or fore plane to remove the wood down to the chamfer lines. Do this for both bottom and top edges.
33. Give the entire bottom another light sanding inside and out with medium sand paper.

Problem Area No. 5: Finishing and painting the nail box.

Objectives: Develop the knowledge and ability of the student to:

Use wood filler to fill set nail or screw head holes.
Sand wood filler properly.
Remove sanding dust before painting.
Seal knots so they will not dry up and fall out.
Select the proper kind of paint to use.
Apply the first coat of paint correctly.
Apply the final coat of paint correctly.

Procedural Steps:

1. The wood filler used should be soft and pliable. Hard or caked filler will not do a satisfactory job of filling small holes.
2. Use a flat wooden stick to get a small amount of filler out of the can. Popsickle-type sticks work well for this.
3. Press the filler firmly into the hole with the stick. Slide the stick sideways. This causes the edge of the hole to pull the filler off the stick. Repeat that until the hole is filled.
4. After the hole is filled, smooth the filler until it is almost level with the surrounding wood. Allow to dry and harden.
5. Repeat steps 2-4 for each nail or screw hole to be filled.
6. Allow the filler to dry according to the directions on its container.
7. After the filler has completely hardened, sand it until it is flush with the surrounding wood. Repeat for each filled hole.
8. Give the entire box one final sanding with fine sandpaper.
9. Use the air gun to blow all the loose sanding dust off the box.

10. Use a moist rag to wipe the box, inside and out, completely clean of the wood dust.
11. Do not get the wood wet when wiping.
12. While the box is drying paint knots with shellac.
13. After the shellac has dried thoroughly, the first coat of paint can be applied.
14. Discuss with the students the type of paint that should be used for a project like this. Decide with them to use enamel because it is harder and will not chip as easily.
15. A 2-inch brush should be used to apply the paint.
16. The first coat should be very light or thin.
17. The order to paint the parts are: inside the small boxes and bottom half of the handle, then the outside and edges of the box and last, the remainder of the handle.
18. Instructions should be given on how to get the paint on the brush.
19. Never stick the brush more than 1/2- inch into the paint. Wipe the excess paint off the brush on the lip of the can. Have the can as close to the box as possible.
20. After the first coat has dried, repeat steps 17-19, applying a thicker, final coat of paint.
21. This time give instructions on which direction to brush the paint the last time to prevent the brush strokes from being visible when the paint dries. Also tell them how to prevent runs.
22. Clean up the brush and let the paint dry over night.
23. The student's name should still be visible on the top of the handle - if not use the stamps to imprint their names on pieces of light metal and use small screws to attach the nameplate.

INSTRUCTIONAL GUIDE

I. ENTERPRISE OR MAJOR UNIT: ANIMALS

II. PROBLEM AREA: CARING FOR A BROOD SOW AND LITTER

III. TEACHER OBJECTIVES: Develop the knowledge and ability of the students to:

1. Select a pregnant gilt or sow to be housed at the laboratory.
2. Prepare a farrowing facility for the sow and litter.
3. Feed and care for the sow before, during and after farrowing.
4. Care for the pigs to weaning.

IV. INSTRUCTION IN APPLIED BIOLOGY AND AGRICULTURE

Lab*	Month	Suggested Activities
7	Dec.	1. Locate a pregnant sow.
4		2. Prepare a farrowing facility.
2		3. Build a farrowing crate.
4	Feb.	4. Bring the sow to laboratory two weeks before farrowing.
4		5. Place the sow in crate one week before farrowing.
4		6. Observe the sow daily before farrow.
4		7. Clean pen daily.
4		8. Feed the sow according to her needs before and after farrowing.
4		9. Assist the sow at farrowing time.
4		10. Care for the pigs as they are born - cut navel, clip needle teeth, notch ears, assist to suckle.
4		11. Weigh the pigs at birth, two, four, six and eight weeks.
4		12. Identify the pigs at birth.
4		13. Clean the pen to maintain good health of pigs.
4		14. Creep feed.
1		15. Register the litter and individual pigs.
4		16. Wean at six weeks.
4		17. Sell sow or return to owner six weeks after farrowing.
7		18. Return pigs to owner or market at eight weeks.

* (1) Classroom (2) Shop (3) Greenhouse (4) Livestock (5) Garden-Nursery (6) Forest (7) Community

V. INSTRUCTIONAL ACTIVITIES IN COMMUNICATIONS

Speaking (Discussion)	Reading	Writing
Each day prepare short speech on a breed of swine. Discuss difference of swine meat and beef meat. Discuss the importance of the swine industry. Use of phone for information. Questioning an order buyer.	Reading response from breed association. Read swine magazines looking for local breeders and sales. Read newspaper articles on swine marketing and prices.	Write letters to breed associations requesting information. Write for descriptive pictures of swine breeds. Make telephone notes. Keep records.

Vocabulary:

1. purebred
2. registration
3. breed
4. association
5. market
6. crossbred
7. slaughter
8. carcass
9. sanitation

VI. INSTRUCTIONAL ACTIVITIES IN MATHEMATICS

Basic Arithmetic	Problems
ADD: 1 lb. 2 oz. 2 lb. 0 oz. 1 lb. 6 oz. 1 lb. 8 oz. 0 lb.15 oz. SUBTRACT: 12 1/2 bushel - 1 1/2 bushel 8 lb. 10 oz. - 1 lb. 2 oz. DIVIDE: 8/ 16 8/ 32.4 $\frac{24}{3} =$ MULTIPLY: .87 x 100 = 2 lbs x 8 = 1.5 x 8 =	Determine average weight of 8 animals if their total weight is 382 pounds. Determine the feed lost from spilling if 1/4 of the 50 pound sack is missing. Determine the total amount of feed consumed if the pigs eat 2 pounds the first week, 6 pounds the second week, and 26 pounds the third week.

VII. INSTRUCTIONAL AIDS

A. References

1. VAS Unit, Caring for the Sow and Litter at Farrowing Time.
2. Animal Science By Ensminger
3. Local order buyer and veterinarian

B. Audio-Visual

1. charts
2. knife, scissors, towels, tincture of iodine, clippers for teech
3. movie projector

SUGGESTED PROBLEM AREAS AND ACTIVITIES

Problem Areas in Animals

1. Caring for the brood sow and litter.
2. Caring for the cow and calf.
3. Caring for the ewe and lambs.
4. Caring for pets.
5. Raising rabbits.
6. Incubating eggs.
7. Raising chicks.
8. Growing capons.
9. Managing bees.
10. Collecting insects.
11. Surveying the animal enterprises in the community.
12. Determining the opportunities for employment.

Problem Area No. 1: Caring For the Brood Sow and Litter

Objectives: Develop the knowledge and ability of the student to:

1. Select a pregnant gilt or sow to be housed at the laboratory.
2. Prepare a farrowing facility for the sow and litter.
3. Feed and care for the sow before, during and after farrowing.

Suggested activities:

1. Locate a pregnant sow.
2. Prepare a farrowing facility.
3. Build a farrowing crate.
4. Bring the sow to laboratory two weeks before farrowing.
5. Place the sow in crate one week before farrowing.
6. Observe the sow daily before farrow.
7. Clean pen daily.
8. Feed the sow according to her needs before and after farrowing.
9. Assist the sow at farrowing time.
10. Care for the pigs as they are born - cut navel, clip needle teeth, notch ears, assist to suckle.
11. Weigh the pigs at birth, two, four, six and eight weeks.
12. Identify the pigs at birth.
13. Clean the pen to maintain good health of pigs.
14. Creep feed.
15. Register the litter and individual pigs.
16. Wean at six weeks.
17. Sell sow or return to owner six weeks after farrowing.
18. Return pigs to owner or market at eight weeks.

*Suggested references:

*See pages 113-124 for list of references.

Problem Area No. 2: Caring For the Cow and Calf

Objectives: Develop the knowledge and ability of the student to:

1. Select a pregnant cow or heifer.
2. Prepare a calving facility for the cow and calf.
3. Feed and care for the cow before, during, and after calving.
4. Care for the calf until weaning.

Suggested activities:

1. Locate a pregnant cow.
2. Prepare a calving facility.
3. Bring the cow to the laboratory.
4. Observe the cow daily before calving.
5. Clean the pen daily.
6. Feed the cow according to her needs.
7. Assist the cow at calving time.
8. Care for the calf as it is born; treat navel, tattoo, assist to suckle.
9. Weigh the calf at birth.
10. Creep feed the calf.
11. Register the calf.
12. Wean calf at six to eight months of age.
13. Sell cow six to eight months after calving.
14. Market calf at six to eight months.

Suggested references: *A-12, 13, 21

Problem Area No. 3: Caring For the Ewe and Lambs

Objectives: Develop the knowledge and ability of the student to:

1. Select a pregnant ewe.
2. Prepare a lambing facility.
3. Feed and care for the ewe before, during and after lambing.
4. Care for the lambs.

Suggested activities:

1. Locate a pregnant ewe.
2. Prepare a pen for parturition.
3. Place ewe in pen three weeks before lambing.
4. Observe ewe daily.
5. Feed the ewe according to her needs before and after parturition.
6. Assist at parturition.
7. Weigh lambs at birth, two, four, six and eight weeks.
8. Creep feed.
9. Register lambs.
10. Wean lambs.
11. Market ewe and lambs or return to owner.

Suggested references: A-6, 15, 17, 20, 22, 23, 24, 25

*References listed on pages 113-124 and highly recommended.

Problem Area No. 4: Caring For Pets

Objectives: Develop the knowledge and ability of the student to:

1. Select feeds to meet needs of selected pets.
2. Prepare feeds.
3. Provide adequate housing.
4. Control diseases and parasites.

Suggested activities:

1. Visit a dog kennel.
2. Visit a supermarket to identify feed on the market.
3. Wash and handle selected pets.
4. Clip a poodle.
5. Examine and treat pets for external parasites.
6. Build a dog house.

Suggested references:

Problem Area No. 5: Raising Rabbits

Objectives: Develop the knowledge and ability of the student to:

1. Raise rabbits.
2. Determine the type of housing needed for rabbits.
3. Follow a breeding program.
4. Market rabbits and the wool.

Suggested activities:

1. Build rabbit hutches.
2. Prepare hutches for occupancy.
3. Calculate amount of feed and supplements needed.
4. Feed rabbits as suggested.
5. Clean hutches and feeders daily.
6. Keep records on rabbits (identify litters and dates of maturity).
7. Keep records of the amount of litters per year.
8. Identify sources of information on market demands.
9. Sell fur (angora) pelts and rabbits.

Suggested references:

Problem Area No. 6: Incubating Eggs

Objectives: Develop the knowledge and ability of the student to:

1. Operate an incubator.
2. Preserve chick embroyos at progressive stages of development.
3. Use practices that contribute to a good hatch.

Suggested activities:

1. Visit a chick hatchery and secure hatching eggs.
2. Prepare the incubator.
3. Open eggs at selected intervals and preserve embroyos.
4. Observe and care for chicks at hatching.
5. Clean, sterilize and store the incubator for future use.

Suggested references: A-1, 2

Problem Area No. 7: Raising Chicks

Objectives: Develop the knowledge and ability of the student to:

1. Select and purchase chicks.
2. Prepare facilities and equipment.
3. Start and raise chicks.
4. Market poultry.

Suggested activities:

1. Obtain or construct feeders and waterers.
2. Clean brooding facility.
3. Prepare brooding facilities.
4. Place chickens in brood facilities.
5. Weigh chicks at selected intervals and plot rate of growth on a chart.
6. Enlarge the housing facilities at three weeks.
7. Perform daily chores.
8. Separate cockerels from hens at four weeks.
9. Caponize cockerels at four weeks.
10. Kill and prepare pullets for a barbecue at twelve weeks.
11. Clean housing facilities.

Suggested references: A-4, 5, 11, 14, 16

Problem Area No. 8: Growing Capons

Objectives: Develop the knowledge and ability of the students to:

1. Select a breed of chicken suitable for caponizing.
2. Raise chicks for capons.
3. Caponize cockerels.
4. Manage the capons after caponizing.
5. Market capons.

Suggested activities:

1. Select and order chicks.
2. Prepare brooding facilities.
3. Caponize the cockerels at four weeks.
4. Examine bird for "wind puffs".
5. Weigh birds at selected intervals to determine gain.
6. Keep records of feed.
7. Kill, scald, pick, chill, eviscerate, truss, and wrap capons.
8. Market.

Suggested references:

Problem Area No. 9: Managing Bees

Objectives: Develop the knowledge and ability of the student to:

1. Make a beginning in operating an apairy.
2. Manage a hive of bees.
3. Remove honey from the hive.
4. Store and market honey.

Suggested activities:

1. Go on a field trip to an apairy.
2. Assemble a bee hive.
3. Place package of bees and queen in hive.
4. Requeen a hive.
5. Feed bees.
6. Open a hive and observe new brood, bees and honey.
7. Remove super when filled with honey.
8. Extract honey.
9. Prepare hive for winter.

Suggested references:

Problem Area No. 10: Collecting Insects

Objectives: Develop the knowledge and ability of the student to:

1. Identify insects which are common in the community.
2. Classify insects into the different orders.
3. Mount and preserve insect samples.

Suggested activities:

1. Build an insect collecting box for mounting specimen.
2. Build a catching net.
3. Show a film about characteristics and classification of insects.
4. Collect insects.
5. Mount and preserve insects.
6. Exhibit insects at local fair.

Suggested references:

Problem Area No. 11: Surveying the Animal Enterprises in the Community

Objectives: Develop the knowledge and ability of the student to:

1. Determine the types and breeds of livestock in the community.
2. Determine the economic importance of each livestock enterprise.
3. Locate in the community the major livestock operations.

Suggested activities:

1. Review census data to determine the number of families raising livestock in the community.
2. Prepare a map of the community and locate livestock farms.
3. Visit representative farmers in district that raise livestock.
4. Visit a local livestock market.
5. Visit a veterinary clinic.

Suggested references: A-7

Problem Area No. 12: Determining the Opportunities for Employment in Animal Industries

Objectives: Develop the knowledge and ability of the student to:

1. Make realistic career goals.
2. Determine competencies required for a desired career.
3. Locate sources of occupational information.

Suggested activities:

1. Discuss job opportunities in animal industries.
2. Identify and list the major animal related businesses in the community.
3. Invite a resource person from a local firm to the class to discuss major competencies they desire in an employee.
4. Review various catalogs or pamphlets on job opportunities in animal industries.

Suggested references:

Problem Areas in Plants and Soils

1. Producing field crops.
2. Producing vegetables.
3. Producing small fruit.
4. Growing vegetable plants.
5. Producing Easter flowers from fall bulbs.
6. Producing chrysanthemums from cuttings.
7. Producing geranium plants from cuttings.
8. Planting and caring for annual and perennial flowers.
9. Planting and caring for trees and shrubs.
10. Propagating peach trees.
11. Establishing a lawn.
12. Determining the opportunities for employment.

Problem Area No. 1: Producing Field Crops

Objectives: Develop the knowledge and ability of the student to:

1. Identify and name the types of field crops.
2. Select the varieties to be grown.
3. Prepare seedbed and plant the seed.
4. Harvest the field crop.

Suggested activities:

1. Have class members grow a selective field crop at the land laboratory and cooperatively perform the following practices.
2. Obtain seed from local dealer.
3. Prepare seeds for planting.
4. Select and prepare seedbed for planting.
5. Apply fertilizer and plant seeds to requirements.
6. Cultivate crop for weeds.
7. Spray crop for weeds.
8. Harvest and market crop.

Suggested references: B-41, 53
F-2

Problem Area No. 2: Producing Vegetables

Objectives: Develop the knowledge and ability of the student to:

1. Plan a garden for selected vegetables.
2. Prepare garden plot and plant.
3. Use approved cultural practices.
4. Harvest and market vegetables.

Suggested activities:

1. Lay out the vegetable growing area at the land laboratory so that each student has 200 square feet of ground.
2. Prepare three foot wide area paths around each plot.
3. Power till or spade each plot.
4. Fertilize and plant selected vegetable seeds and plants at the proper time.
5. Control weeds, insects and diseases.
6. Harvest and sell or take home ripe or mature vegetables.
7. Tour a truck farm.

Suggested references: B-50, 60

Problem Area No. 3: Producing Small Fruit

Objectives: Develop the knowledge and ability of the student to:

1. Select site for small fruit.
2. Prepare seed bed.
3. Plant, fertilize and care for the crop.
4. Harvest crop.
5. Market the small fruit.

Suggested activities:

1. Have class members cooperatively grow a patch of strawberries at the land laboratory and perform the following practices.
2. Apply fertilizer.
*3. Plant strawberries.
4. Cultivate and hoe plant to control weeds.
5. Mulch plants for the winter.
6. Spray for spittle bugs and snails.
7. Harvest, package and market berries.
8. Keep records on group project.

*Each student plants a row. This row is labeled with his name. He has the responsibility to care for his row through harvest.

Suggested references: B-16, 58, 59

Problem Area No. 4: Growing Vegetable Plants

Objectives: Develop the knowledge and ability of the student to:

1. Propagate from seed tomatoes and cabbage.
2. Prepare soil media.
3. Prepare flats and plant seeds.
4. Use appropriate cultural techniques.
5. Transplant or pot seedlings.
6. Market or plant in field.

Suggested activities:

1. Construct flats in school shop.
2. Prepare soil.
3. Fill flats and plant seeds.
4. Water, maintain correct temperature and light.
5. Transplant to cold frames or pots.
6. Control pests and diseases.

Suggested references: B-50, 60

Problem Area No. 5: Producing Easter Flowers From Fall Bulbs

Objectives: Develop the knowledge and ability of the student to:

1. Identify appropriate Easter flowers to be grown from bulbs.
2. Determine approved practices.
3. Grow a crop.
4. Market flowers.

Suggested activities:

1. Take a field trip to local greenhouse specializing in growing Easter flowers.
2. Obtain bulbs for fall planting.
3. Select pots and prepare soil media.
4. Have each student pot bulbs and label with his name.
5. Bury pots in sawdust outdoors to permit the bulb to go through the cool resting stage.
6. Bring pots into the greenhouse where the appropriate environment can be controlled.
7. Force the bulb for Easter flowering.
8. Sell flowers to teaching staff.

Suggested references: B-13

Problem Area No. 6: Producing Chrysanthemums From Rooted Cuttings

Objectives: Develop the knowledge and ability of the student to:

1. Prepare potting soil.
2. Determine method of planting.
3. Use proper cultural practices.
4. Prepare for market.

Suggested activities:

1. Visit a greenhouse to observe the steps followed by a grower in producing a crop of mums.
2. Grow a crop of mums in the school greenhouse. Perform the following steps:
    a. Order rooted cuttings six months in advance of planting.
    b. Prepare soil.
    c. Plant cuttings in pots.
    d. Water.
    e. Fertilize.
    f. Maintain proper temperature.

g. Pinch plants.
h. Market.

Suggested references: B-3, 4, 13

Problem Area No. 7: Producing Geranium Plants From Cuttings

Objectives: Develop the knowledge and ability of the student to:

1. Prepare potting soil.
2. Plant in pot for Memorial Day.
3. Use proper cultural practices.
4. Market crop.

Suggested activities:

1. Visit a greenhouse to observe the steps followed by the grower in producing a crop of geraniums.
2. Grow a crop of geraniums in the school greenhouse. Perform the following steps:
   a. Prepare cuttings from stock plants and root.
   b. Prepare soil.
   c. Plant rooted cuttings in 4" pots on March 1.
   d. Water.
   e. Provide correct light.
   f. Maintain proper temperature.
   g. Control pests and diseases.
   h. Market.

Suggested references: B-13

Problem Area No. 8: Planting and Caring for Annual and Perennial Flowers

Objectives: Develop the knowledge and ability of the student to:

1. Select annual and perennial plants to be grown out of doors and determine where to plant.
2. Prepare soil and plant the annuals and perennials.
3. Use approved cultural practices.

Suggested activities:

1. Visit several homes to determine how annual and perennials fit into the landscape plan.
2. Plant perennial flowering plants at the land laboratory or the high school.
3. Plant annual flower plants in beds at the land laboratory or the high school.
4. Have students perform the following activities:
   a. Identify a location for a flower bed.
   b. Prepare the bed.
   c. Plant annuals and perennials.
   d. Fertilize.
   e. Water.
   f. Control pests and diseases.

Suggested references: B-23, 24, 55, 56, 57

Problem Area No. 9: Planting and Caring For Trees and Shrubs

Objectives: Develop the knowledge and ability of the student to:

1. Select ornamental trees and shrubs.
2. Prepare proper soil for selected trees.
3. Plant selected trees and shrubs properly.
4. Fertilize and maintain trees and shrubs.

Suggested activities:

1. Show slides of major ornamental trees and shrubs available in the area.
2. Prepare proper soil mixture.
3. Discuss advantages of adding compost pile or organic matter to the soil.
4. Order trees and shrubs in advance.
5. Plant trees and shrubs.
6. Maintain trees in upright position with guy wires.
7. Water and fertilize trees and shrubs.
8. Protect trees and shrubs from insects and cold weather.

Suggested references: B-28, 52

Problem Area No. 10: Propagating Peach Trees

Objectives: Develop the knowledge and ability of the student to:

1. Reproduce fruit trees.
2. Grow seedlings for budding.
3. Propagate trees by budding.
4. Plant trees in orchard.

Suggested activities:

1. Visit a nursery.
2. Obtain peach pits.
3. Stratify peach pits.
4. Plant seeds in nursery.
5. Care for trees - cultivate.
6. Select cion wood from which buds will be taken.
7. Bud the trees.
8. Remove tap growth after bud "takes".
9. Root prune.
10. Plant in the field.

Suggested references: B-9

Problem Area No. 11: Establishing A Lawn

Objectives: Develop the knowledge and ability of the student to:

1. Plan for establishing a lawn.
2. Start a lawn by seeding.
3. Identify factors which contribute to the establishment of a good lawn.

Suggested activities:

1. Discuss major steps to be considered in establishing a lawn.
2. Show a series of slides or pictures that indicate sequential steps involved in establishing a lawn.
3. Select a piece of land suitable for a lawn.
4. Determine the slope of the lawn area.
5. Incorporate humus to the top soil and mix the seed bed.
6. Smooth seed bed.
7. Sprinkle irrigate to determine low spots and fill low spots with additional soil.
8. Select and buy a seed mixture.
9. Seed the lawn as directed on the package and cover the seed.
10. Roll the seeded area.
11. Mulch the slopes with straw or burlap.
12. Install sprinkler irrigation system.
13. Irrigate the area as needed.
14. Discuss major maintenance factors for a good lawn.
15. Fertilize the lawn.
16. Adjust cutting height of the mower.
17. Mow the lawn.
18. Apply weed killers, fungicides, insecticides, etc., if needed.

Suggested references: B-61

Problem Area No. 12: Determining the Opportunities for Employment

Objectives: Develop the knowledge and ability of the student to:

1. Identify types of employment available.
2. Make realistic career goals.
3. Determine competencies required for a desired job.

Suggested activities:

1. Identify major job opportunities in the field of plant science.
2. Discuss the responsibilities of various personnel in an agronomy business firm.
3. Identify competencies required of the major employees in an agronomy business firm.
4. Present to students samples of placement catalogs containing job opportunities in plant industries.
5. Invite selected resource people to talk to the students about career opportunities.
6. Visit selected businesses to determine the employment opportunities.

Suggested references:

Problem Areas in Forest, Wildlife and Recreation

1. Inventorying the forest resources.
2. Managing and harvesting forest products.
3. Planting trees.
4. Determining land capabilities.
5. Building trails.
6. Identifying and labeling plant and tree specimens and noteworthy features of the forest laboratory.
7. Planting shrubs and other plants for wildlife cover and feed.
8. Hunting with firearms.
9. Fishing.
10. Inventorying forest, wildlife and recreational resources of the community.
11. Determining the opportunities for employment.

Problem Area No. 1: Inventorying the Forest Resources

Objectives: Develop the knowledge and ability of the student to:

1. Identify the wild animals that live in the forest laboratory.
2. Identify the vegetative cover including trees, shrubs, flowers and other plants.
3. Identify the physical features of the land.
4. Identify rocks, fossils and other inorganic materials.

Suggested activities:

1. Scout the land laboratory to look for signs of wildlife.
2. Make a map of the forest laboratory and label the location of burrows, den, trees, bird nests, deer trails, watering holes and other signs of wildlife.
3. Divide the land laboratory into ten equal blocks. Identify and inventory trees growing on one or more of the blocks.
4. Develop a museum in the laboratory building.
5. Collect samples of rock. Identify and display the samples.
6. Make a model of the land laboratory for display in the museum.
7. Collect leaves. Mount, label and display in the museum.
8. Photograph features of the forest laboratory and publicize in the local newspaper.
9. Collect and mount insects found in the forest.
10. Develop a bulletin board. Illustrate with pictures clipped from magazines the birds and wild animals living in the forest laboratory.

Suggested references: C-25

Problem Area No. 2: Managing and Harvesting Forest Products

Objectives: Develop the knowledge and ability of the student to:

1. Identify marketable trees.
2. Cut trees.
3. Prepare trees for market.
4. Replant adapted varieties.
5. Harvest nuts.

Suggested activities:

1. Remove dead limbs from evergreen trees.
2. Shear Christmas trees.
3. Identify trees to be harvested and mark.
4. Safely fell with a chain saw a mature tree and cut into saw logs.
5. Cut a cord of paper wood.
6. Cut a cord of fire wood.
7. Cut and bale Christmas trees.
8. Replant tree after cutting mature tree.
9. Identify nut trees and harvest nuts.
10. Visit a tree farm, paper mill and sawmill.
11. Dig nursery seedlings and bunch for market.
12. Market forest product.

Suggested references:

Problem Area No. 3: Planting Trees

Objectives: Develop the knowledge and ability of the student to:

1. Determine source of seedlings.
2. Identify adapted varieties.
3. Determine when to plant.
4. Use approved planting methods.
5. Care for seedlings.

Suggested activities:

1. Invite a state forester to speak to the class about planting trees.
2. Visit a tree farm to observe the planting operations.
3. Each student plant trees on an open area of the forest land.
4. Underplant a block of forest laboratory.
5. Cut shrubs and trees that compete with seedlings.

Suggested references: B-11, 27, 30

Problem Area No. 4: Determining Land Capabilities

Objectives: Develop the knowledge and ability of the student to:

1. Evaluate the capability of the land to grow forest products and provide recreation.
2. Match the forest plantings with the land capability.

Suggested activities:

1. Go on a field trip to look at aerial photographs in the Soil Conservation office and make paper tracings of land to be considered.
2. Make a map of the forest laboratory.
3. Walk over the land laboratory to observe the topography, physical features, growing trees and plants, open areas, and wildlife.
4. Determine if man by mining and harvesting timber has upset nature's balance.
5. List the improvements to be made on the forest laboratory.

Suggested references: B-48

Problem Area No. 5: Building Trails

Objectives: Develop the knowledge and ability of the student to:

1. Judge the topography and landscape as to trail development.
2. Clear and develop an effective trail.
3. Develop trails to take full advantage of the esthetic aspects of the forest.
4. Place trails to prevent erosion and landscape deterioration.

Suggested activities:

1. Survey wood land to determine hiking trails.
2. Clear brush from trails.
3. Defoliate actual path.
4. Build dikes and steps to guard against erosion.
5. Build bridges across gullies.
6. Develop and install markers to identify all trails.
7. Produce and install markers to point out natural phenomenon.
8. Promote and advertise the trails for public use.

Suggested references:

Problem Area No. 6: Identifying and Labeling Plant and Tree Specimens and Noteworthy Features of the Forest Laboratory

Objectives: Develop the knowledge and ability of the student to:

1. Identify the major plants in the local community.
2. Recognize the advantages of being able to identify major plants in the community.
3. Prepare labels for the identification of desired plants.

Suggested activities:

1. Discuss the importance of recognizing plants growing in the forest laboratory.
2. Review related botany books to learn the identifying characteristics of selected plants.
3. Collect plant parts or specimens and identify.
4. Discuss advantages of having labels for plants.
5. Identify major plants to be labeled.
6. Prepare labels for the plants.
7. Install the labels.

Suggested references: B-29

Problem Area No. 7: Planting Shrubs and Other Plants for Wildlife Cover and Feed

Objectives: Develop the knowledge and ability of the student to:

1. Select plants and shrubs for feed and cover.
2. Plant shrubs in key locations.
3. Identify five shrubs that can be used for food and cover.
4. Care for plants and shrubs that are used.

Suggested activities:

1. Visit county ASCS office, talk to persons about wildlife conservation.
2. Survey the forest laboratory for possible sites for planting shrubs.
3. Visit a nursery to identify plants and shrubs.
4. Select plants and shrubs for cover and feed.
5. Plant selected shrubs.
6. Care for shrubs and plants.
7. Check periodically to determine use.

Suggested references:

Problem Area No. 8: Hunting With Firearms

Objectives: Develop the knowledge and ability of the student to:

1. Use firearms safely.
2. Identify parts of a rifle and shot gun.
3. Select ammunition for intended game.
4. Clean firearms.
5. Use firearms in hunting small and large game.

Suggested activities:

1. Use firearm safety.
2. Identify parts of shotguns and rifles.
3. Clean firearms.
4. Select ammunition for its use.
5. Identify game in the community.
6. Follow hunting laws.
7. Prepare a chart of the different characteristics of local game.
8. Make posters exhibiting the different specimen of local game.
9. Use approved techniques in hunting game.
10. Make holders for targets and gun rest for a shooting range.
11. Interview game conservation officer.
12. Target practice at supervised shooting range.
13. Take field trip to shoot game.
14. Dress and prepare game for the table.

Suggested references:

Problem Area No. 9: Fishing

Objectives: Develop the knowledge and ability of the student to:

1. Fish as a means of recreation.
2. Identify fish by their characteristics.
3. Bait hook, cast line, and catch fish.
4. Clean and cook fish over an open fire.

Suggested activities:

1. View film on fishing.
2. Visit a fish hatchery.
3. Identify species of fish.
4. Make posters on habits and characteristics of fish.
5. Visit a sporting goods store to price equipment.

6. Select equipment for fishing in rivers, lakes and farm ponds.
7. Make bank poles and trout lines.
8. Interview conservation warden for laws and regulations.
9. Practice using equipment.
10. Obtain bait and lines.
11. Go fishing.
12. Dress, fry and eat fish.

Suggested references: C-10, 11, 38

Problem Area No. 10: Inventorying Forest, Wildlife and Recreational Resources Of the Community

Objectives: Develop the knowledge and ability of the student to:

1. Conserve natural resources.
2. Identify the natural resources in the community.

Suggested activities:

1. Take a weekend camping trip to a local State park.
2. Visit a local game preserve.
3. Test water from the rivers and streams to determine pollution.
4. Make a map of the community and identify the location of the forests, wildlife and recreational resources.

Suggested references: C-30, 31, 40, 41

Problem Area No. 11: Determining the Opportunities For Employment

Objectives: Develop the knowledge and ability of the student to:

1. Identify employment opportunities in forest wildlife at the local level.
2. Recognize areas of career interests in forest wildlife.
3. Apply for and secure a job related to forest wildlife.

Suggested activities:

1. Contact State or Federal agencies and collect career information on forest and wildlife.
2. Discuss job opportunities in the field.
3. Identify major competencies required for three major jobs in forestry and wildlife conservation.
4. Discuss advantages of having a job in the areas related to forestry and wildlife conservation.
5. Discuss and suggest procedural steps in applying and securing a job related to forest wildlife.

Suggested references: C-35

Problem Areas in Basic Mechanics and Construction

1. Building a nail box.
2. Building a metal tool box.
3. Building a saw horse.
4. Building greenhouse flats.
5. Building a birdhouse.
6. Building a bird feeder.
7. Building a rabbit hutch.
8. Building an outdoor pen for pheasants.
9. Building a farrowing crate.
10. Making markers and signs.
11. Constructing chick raising facilities.
12. Contouring fields.
13. Laying concrete blocks, brick and stone.
14. Constructing a concrete floor.
15. Disassembling and reassembling a small gasoline engine.
16. Wiring an electrical circuit.
17. Fitting hand tools.
18. Operating a farm tractor safely.
19. Framing a small building.
20. Roofing a building.
21. Painting a building.
22. Building a stone fireplace.
23. Constructing a picnic table.
24. Servicing a farm tractor.
25. Welding, brazing and cutting metal.
26. Determining the opportunities for employment in agricultural mechanics.

Problem Area No. 1: Building a Nail Box

Objectives: Develop the knowledge and ability of the student to:

1. Read a plan (see appendix D).
2. Draw working plans.
3. Select lumber.
4. List a bill of materials.
5. Select hand tools.
6. Develop woodworking skills by constructing a project.
7. Personalize and finish project.

Suggested activities:

1. Make working plan of project.
2. Construct the handle of nail box.
3. Make bottom and dividers. Assemble handle, bottom and dividers.
4. Make ends and sides. Assemble.
5. Finish and paint.

Suggested references: D-6

Problem Areas No. 2: Building a Metal Tool Box

Objectives: Develop the knowledge and ability of the student to:

1. Read a detailed drawing of the project (see appendix
2. Layout and cut sheet metal.
3. Fabricate, assemble and fasten parts.
4. Finish box.

Suggested activities:

1. Compare a sample of the finished project with the plan.
2. Select tools and materials for the project.
3. Determine safe procedure to use in working with metal.
4. Lay out and cut out parts for the project.
5. Bend and form parts.
6. Assemble and fasten the parts together.
7. Finish the tool box.
8. Evaluate the tool box, checking against the plan specifications and dimensions.

Suggested references: D-6

Problem Area No. 3: Building a Saw Horse

Objectives: Develop the knowledge and ability of the student to:

1. Read a working plan
2. Select lumber and hardware.
3. Lay out, cut and assemble parts of project.
4. Finish and personalize.
5. Evaluate project.

Suggested activities:

1. Compare plans with finished product.
2. Select lumber for horse body.
3. Select lumber for legs and aprons.
4. Lay out horse body and gain in for each leg.
5. Lay out and cut out legs.
6. Assemble legs to body.
7. Lay out, cut out and assemble aprons.
8. Fasten all parts securely.
9. Finish and paint horse.

Suggested references: D-6

Problem Area No. 4: Building Greenhouse Flats

Objectives: Develop the knowledge and ability of the student to:

1. Select wood for flat construction.
2. Sketch plan before construction.
3. Follow directions.
4. Assemble pieces for final product.

Suggested activities:

1. Obtain pictures of completed flats.
2. Make detailed drawing of flat.
3. Determine needed bill of materials and cost.
4. Obtain lumber and hardware.
5. Cut sides and bottom of flat to specified size.
6. Treat wood with copper napthenate preservative.
7. Stack flats for drying and storing.

Suggested references: D-6

Problem Area No. 5: Building a Birdhouse

Objectives: Develop the knowledge and ability of the student to:

1. Identify patterns and plans for birdhouses.
2. Determine the bill of materials needed for a plan.
3. Machine and assemble the materials in a correct pattern and form.
4. Place a birdhouse to insure occupancy.
5. Determine other construction factors affecting continued occupancy.

Suggested activities:

1. Obtain plans for several types of birdhouses.
2. Select a plan suitable for the bird desired.
3. Determine amount and kind of materials needed.
4. Obtain desired materials.
5. Determine actual dimensions of each piece.
6. Cut each piece to the specified size.
7. Assemble pieces with nails and screws.
8. Leave unpainted.
9. Identify areas where birdhouses may be placed.
10. Place birdhouses.
11. Visit birdhouses to determine occupancy.
12. Re-visit birdhouses to clean out in anticipation of next occupant.

Suggested references: D-6

Problem Area No. 6: Building a Bird Feeder

Objectives: Develop the knowledge and ability of the student to:

1. Identify patterns and plans for bird feeders.
2. Determine the bill of materials needed for a plan.
3. Cut and assemble materials correctly.
4. Determine construction factors affecting use.

Suggested activities:

1. Obtain plans for several types of bird feeders.
2. Select plan for feeder desired.
3. Determine bill of materials needed.
4. Obtain desired materials.
5. Determine actual dimensions of each piece.
6. Cut each piece to actual size.
7. Assemble pieces with nails and screws.
8. Leave unpainted.
9. Place bird feeder for optimum use.

Suggested references:

Problem Area No. 7: Building a Rabbit Hutch

Objectives: Develop the knowledge and ability of the student to:

1. Identify plan for a rabbit hutch.
2. Determine the bill of materials needed for a plan.
3. Cut and assemble materials.

Suggested activities:

1. Obtain plans for several types of rabbit hutches.
2. Select a plan to use.
3. Determine the bill of materials needed.
4. Obtain materials needed.
5. Cut materials to specifications.
6. Assemble the hutch.
7. Leave hutch unpainted.
8. Put hutch to use.

Suggested references:

Problem Area No. 8: Building Outdoor Pen for Pheasant

Objectives: Develop the knowledge and ability of the student to:

1. Determine enclosed area needed per bird.
2. Decide on the design of the enclosure.
3. Construct the enclosure.
4. Use the facility for pheasants.

Suggested activities:

1. Visit a pheasant raising operation.
2. Decide through discussion after reading available literature the location, construction materials and general plans for the pen and run.
3. Construct the pen and run.
4. Place pheasant in the enclosure.
5. Photograph and publicize.

Suggested references:

Problem Area No. 9: Building a Farrowing Crate

Objective: Develop the knowledge and ability of the student to:

1. Select a useable plan.
2. Determine a bill of materials for the plan.
3. Estimate cost from bill of materials.
4. Assemble materials to the plan.

Suggested activities:

1. Obtain plans for various types of farrowing crates.
2. Select plan according to needs.
3. Determine bill of materials.
4. Obtain materials.
5. Cut material to size.
6. Assemble with appropriate hardware.
7. Treat wood with preservative and paint metal.
8. Use or market finished product.

Suggested references:

Problem Area No. 10: Making Markers and Signs

Objectives: Develop the knowledge and ability of the student to:

1. Center and plan a sign.
2. Draw freehand pictures and letters.
3. Use stencils and pens in lettering.
4. Select materials for use in signs.

Suggested activities:

1. Obtain patterns of several types of signs.
2. Determine various materials that can be used.
3. Select various basic sign designs to use.
4. Sketch design of sign in pencil.
5. Fill in design with ink or paint.
6. Letter signs. Use freehand, stencil or wood burner.
7. Preserve sign by covering with paint or varnish.
8. Determine cost of making signs and markers.

Suggested references:

Problem Area No. 11: Preparing Chick Raising Facilities

Objectives: Develop the knowledge and ability of the student to:

1. Identify a suitable location.
2. Prepare the physical layout to confine birds.
3. Install brooding equipment.

Suggested activities:

1. Prepare room to accommodate the chicks.
2. Place partition between the chicks and feed storage.
3. Construct bins or locate containers for feed.
4. Install heat lamps 18" above litter.

5. Erect a circular cardboard fence around the heat lamps large enough in diameter to accommodate feeders, water and chicks.
6. Close all holes or openings to the outside of building to prevent entrance by rodents.

Suggested references:

Problem Area No. 12: Contouring a Field

Objectives: Develop the knowledge and ability of the student to:

1. Use a land level.
2. Establish a base line.
3. Lay out contour strips.

Suggested activities:

1. Set up a transet or form level and learn hand signals.
2. Prepare stakes with red tops.
3. Take a field trip to look at contoured fields.
4. Lay out contour strips on a large sloping field.

Suggested references:

Problem Area No. 13: Laying Concrete Blocks, Bricks and Stone

Objectives: Develop the knowledge and ability of the student to:

1. Identify masonry units.
2. Prepare mortar.
3. Handle equipment.
4. Lay block, brick and stone.

Suggested activities:

1. Visit block plant to observe the block making operation.
2. Lay up a block corner.
3. Lay up a brick corner.
4. Build a stone fireplace.
5. Visit a building under construction to observe the use of blocks, bricks and stone.

Suggested references:

Problem Area No. 14: Constructing a Concrete Floor

Objectives: Develop the knowledge and ability of the student to:

1. Determine the value of concrete floors.
2. Select aggregates and cement.
3. Proportion ingredients and mix concrete.
4. Place concrete.
5. Finish and cure concrete.

Suggested activities:

1. Guide the students in making a list of the general types of uses for concrete floors.

2. Listen to a local construction company representative talk about the uses of concrete in floor construction and the basic steps involved in constructing a concrete floor.
3. Visit a building site to observe construction of a concrete floor.
4. Construct a small concrete floor.
5. Have the students outline steps involved in constructing a concrete floor.

Suggested references:

Problem Area No. 15: Disassembling and Reassembling a Small Gasoline Engine

Objectives: Develop the knowledge and ability of the student to:

1. Name the parts of a small gasoline engine.
2. Determine the function of each part.
3. Use special tools correctly.
4. Use wrenches correctly.
5. Follow oral and written instructions.

Suggested activities:

1. Demonstrate use of socket, box and end wrenches.
2. Demonstrate starting and operating a small engine.
3. Provide each student with a small gasoline engine (same make and model for all) and tools.
4. Demonstrate the disassembling of the engine step by step. Have students observe and then perform.
5. Name the parts and functions as each is removed.
6. Demonstrate the reassembling of the engine step by step. Have students observe and perform.
7. Adjust engine and start.

Suggested references: D(c) - 1, 7, 9-12

Problem Area No. 16: Wiring an Electrical Circuit

Objectives: Develop the knowledge and ability of the student to:

1. Identify electrical equipment.
2. Use electrical terms.
3. Determine approved safe practices in wiring.
4. Wire an electrical circuit.

Suggested activities:

1. Use charts to discuss the various electrical equipment used in making a circuit.
2. Demonstrate the kinds of splices used in making a circuit. Have students make splices.
3. Demonstrate making an electrical circuit.
4. Have each student wire an electrical circuit.
5. Have each student evaluate another student's circuit to determine if approved practices in wiring were followed.

Suggested references: D(b) - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13

Problem Area No. 17: Fitting Hand Tools

Objectives: Develop the knowledge and ability of the students to:

1. Assemble necessary equipment for fitting hand tools.
2. Prepare grinding wheels.
3. Joint hand tools.
4. Sharpen hand tools by grinding.
5. Hone hand tools.
6. Check cutting angles and squareness of hand tools.

Suggested activities:

1. Make a tool grinding gauge.
2. Dress and true grinding wheels and oilstones.
3. Joint, sharpen and hone a wood chisel.
4. Joint, square up, and sharpen a plane iron.
5. Make a blade whetting jig.
6. Whet the plane with whetting jig.
7. Joint and sharpen a knife blade.
8. Finish the knife blade with a butcher's steel.
9. Make a four-sided sharpening paddle.
10. Sharpen a knife blade with the sharpening paddle.
11. Power whet a knife blade.
12. Joint, balance, grind, and whet an axe or hatchet blade.
13. Straighten and sharpen auger bit threads.
14. Polish the twist of an auger bit.
15. Sharpen the cutting lips of an auger bit.
16. Joint, set, and file a hand saw.
17. Joint, square, and sharpen a cold chisel.
18. Grind off the mushroom head of a cold chisel.
19. Make a twist drill sharpening guide.
20. Use sharpening guide to sharpen a twist drill.
21. Joint and square a screw driver blade.
22. Grind a new point on a center punch.
23. Grind a new end on a pin punch.
24. Sharpen a pair of tin snips with a file.
25. Finish the blades of a pair of tin snips or scissors by honing on a fine oilstone.
26. Replace a hammer handle.

Suggested references:

Problem Area No. 18: Operating a Farm Tractor Safely

Objectives: Develop the knowledge and ability of the student to:

1. Prepare a tractor for starting.
2. Properly start a tractor engine under safe conditions.
3. Properly hitch a tractor to an implement.
4. Properly maintain a tractor for safe operation.
5. Properly operate a tractor under all conditions.

Suggested activities:

1. Prepare a tractor for starting.
2. Attach a SMV emblem to a tractor.
3. Discuss the importance of proper personal attire for operating a tractor.

4. Start a tractor engine.
5. Shift gears and start a tractor in motion.
6. Set tractor brakes for hitching.
7. Pull a vehicle with the tractor using a chain.
8. Hitch an implement to a tractor.
9. Refuel a tractor.
10. Add coolant to a tractor radiator.
11. Lubricate a tractor.
12. Jack up tractor using a jack.
13. Change wheels on a tractor.
14. Ground a tractor for doing beltwork.
15. Put a belt on the tractor pulley and line it up.
16. Prepare a tractor for driving at high speeds.
17. Operate a tractor power take-off.
18. Hitch up a power take-off and put power line shielding in place.
19. Attach a rear view mirror to a tractor.
20. Check a tractor for loose steering.
21. Show a film indicating that accidents take due to carelessness.

Suggested references:

Problem Area No. 19: Framing a Small Building

Objectives: Develop the knowledge and ability of the student to:

1. Design a small building.
2. Determine materials needed for framing the building.
3. Determine cost of the building.
4. Buy building materials.
5. Lay out materials and begin construction in a logical sequence.

Suggested activities:

1. Observe several types of buildings.
2. Design a small building.
3. Make a list of materials.
4. Select type of lumber and building materials.
5. Determine cost of lumber and building materials.
6. Purchase lumber and building materials.
7. Saw lumber to proper lengths.
8. Assemble building frame.
9. Lay out and cut a rafter.
10. Apply roof sheathing.
11. Apply side walls.
12. Move building to its use site.

Suggested references:

Problem Area No. 20: Roofing a Building

Objectives: Develop the knowledge and ability of the student to:

1. Prepare surface for roofing.
2. Determine how much roofing materials is needed.
3. Install new roofing.

Suggested activities:

1. Examine types of roofing available.
2. Select type of roofing needed.
3. Purchase type of roofing needed.
4. Obtain ladders, hammers, safety items, and other tools.
5. Prepare roof surface.
6. Apply and fasten new roofing materials.
7. Clean up area.
8. Return equipment.

Suggested references:

Problem Area No. 21: Painting a Building

Objectives: Develop the knowledge and ability of the student to:

1. Determine amount and kind of paint required.
2. Prepare the surface for painting.
3. Apply paint properly.
4. Use safe practices in painting.

Suggested activities:

1. Determine amount of paint required.
2. Visit a paint store to get information on various types of paint.
3. Buy paint and other materials needed.
4. Remove screens and shutters.
5. Scrape off blistered paint.
6. Caulk cracks around windows and other openings.
7. Remove light fixtures and other hardware.
8. Reset popped nails and renail loose boards.
9. Fill nail holes.
10. Spot prime bare wood and metal surfaces.
11. Station ladders properly.
12. Mix paint.
13. Apply paint.
14. Clean up materials and area.

Suggested references:

Problem Area No. 22: Building a Stone Fireplace

Objectives: Develop the knowledge and ability of the student to:

1. Select plans.
2. Select stones.
3. Mix mortar and lay stone.
4. Finish mortar joint.
5. Install steel grill or bars.

Suggested activities:

1. Collect pictures of stone fireplaces. Examine plans and select a plan that will be used to construct a fireplace.
2. Examine a stone fireplace and note construction features.

3. Locate and haul stone to a selected site.
4. Construct a foundation with concrete.
5. Mix mortar.
6. Select stone and lay.
7. Strike mortar joints and tool.
8. Install grates and grill.
9. Try out and publicize.

Suggested references:

Problem Area No. 23: Constructing a Picnic Table

Objectives: Develop the knowledge and ability of the student to:

1. Select an appropriate plan.
2. Select building materials.
3. Lay out, cut and assemble parts.
4. Finish, locate and use table.

Suggested activities:

1. Locate and review plans.
2. Observe pictures of completed tables.
3. Prepare a bill of materials for picnic table.
4. Take a trip to lumber yard to select lumber and hardware.
5. Fabricate and assemble table.
6. Paint table and locate at the forest laboratory.

Suggested references:

Problem Area No. 24: Servicing a Farm Tractor

Objectives: Develop the knowledge and ability of the student to:

1. Locate areas of service maintenance.
2. Service and maintain daily.
3. Prevent breakdowns and work stoppage.
4. Prevent unneeded major overhauls.

Suggested activities:

1. Determine use of instrument panels.
2. Service tractor daily with oil and grease.
3. Check engine ignition system.
4. Service steering, brakes, and hydraulic systems.
5. Adjust valves, valve lifters and rocker arms.
6. Change oil in engine.
7. Service battery, spark plugs and points.
8. Check tires for wear and air pressure.
9. Service air filtering system.
10. Prepare tractor for winter use and storage.

Suggested references: D(d) - 2, 5

Problem Area No. 25: Welding, Brazing and Cutting Metal

Objectives: Develop the knowledge and ability of the student to:

1. Identify, select and use appropriate welding rods.
2. Join two pieces of metal by electric arc welding and oxy-acetylene welding.
3. Weld metal in flat, vertical and overhead positions.
4. Cut metal to size.

Suggested activities:

1. Visit a welding or fabrication shop.
2. Identify and label equipment needed for arc and oxy-acetylene welding.
3. Identify arc electrodes by primary and secondary color markings.
4. Arc weld, using different mild-steel electrodes in horizontal, vertical and overhead positions.
5. Join two pieces of metal using butt, lap, fillet, corner, and edge welds.
6. Practice welds using different electrodes and heat ranges.
7. Practice lighting torch and draining hoses of oxy-acetylene welding outfit.
8. Light blowpipe and obtain a neutral, oxidizing and carbonizing flame on the oxy-acetylene torch.
9. Make molten puddles on mild steel using the torch.
10. Run beads on mild steel with bronze rod.
11. Join two pieces of metal with the oxy-acetylene torch with butt, lap, corner, fillet and edge welds.
12. Cut mild steel using the oxy-acetylene cutting torch.

Suggested references:

Problem Area No. 26: Determining the Opportunities For Employment in Agricultural Mechanics

Objectives: Develop the knowledge and ability of the student to:

1. Identify the major areas of agricultural mechanics.
2. Explore interest in agricultural mechanics.
3. Identify sources of occupational information in major areas of agricultural mechanics.
4. Apply and interview for a desired job in agricultural mechanics.

Suggested activities:

1. Discuss and identify major areas of agricultural mechanics, (e.g. farm machinery, farm power, farm electricity, soil and water management, etc.).
2. Discuss and list on chalkboard the competencies required of a person applying for a job in each of the selected areas.
3. Identify ways of obtaining information on job opportunities in areas related to agricultural mechanics.
4. Discuss methods of applying and interviewing for a job in agricultural mechanics areas.
5. Role-play a job interview situation.

Suggested references:

Problem Areas in Leadership and Human Relations

1. Becoming a leader.
2. Understanding the group.
3. Developing leadership skills.
4. Developing communications skills.
5. Making the individual count.
6. Conducting organizational business in a democratic way.
7. Making good use of leisure time.
8. Serving my country.
9. Grooming and dressing for the occasion.
10. Meeting and introducing people.

Problem Area No. 1: Becoming a Leader

Objectives: Develop the knowledge and ability of the student to:

1. Recognize leadership characteristics.
2. Develop into a leader.
3. List the duties of a leader.

Suggested activities:

1. Invite the president of an organization to speak to the group about the need for leaders.
2. Class discussion.
3. Guide elementary students through the forest laboratory.

Suggested references: E(c) - 15, 17, 23

Problem Area No. 2: Understanding the Group

Objectives: Develop the knowledge and ability of the student to:

1. Identify the group's wants and needs.
2. Work with the group.
3. Communicate with each individual.
4. Determine the leaders of the group.

Suggested activities:

1. Divide the class into small groups.
2. Select a leader from within the group.
3. Select one topic for each group to debate.
4. Determine the opinion of the group.
5. Reorganize groups, placing all leaders in one group.
6. Select new topic for each group to debate.
7. Determine the different results obtained.
8. List skills needed for better understanding.

Suggested references: E(c) - 10-14, 19

Problem Area No. 3: Developing Leadership Skills

Objectives: Develop the knowledge and ability of the student to:

1. Conduct a meeting.
2. Set examples for the followers.
3. Present a topic to a committee.
4. Be persuasive and clear in speaking.

Suggested activities:

1. Make chart of "pecking orders" in organizations.
2. List techniques in conducting group meetings.
3. List goals and objectives of a group meeting.
4. Conduct a mock meeting.
5. Make programs to be followed in meetings.
6. Practice parliamentary procedure.
7. Alternate chairman of meeting.
8. List characteristics of a good leader.

Suggested references: E(c) - 1, 5, 10, 11, 12

Problem Area No. 4: Developing Communications Skills

Objectives: Develop the knowledge and ability of the students to:

1. Communicate verbally and orally.
2. Express himself in writing and graphically.
3. Understand and relate his feelings through non-verbal means.

Suggested activities:

1. Have the students experience the position of others via role-playing situations. (Peer centered)
2. Have the student experience the views of adults via role-playing situations in which adults are included.
3. Have students explain their feelings toward a friend or pet in an informal small group gathering.
4. Have each student attempt to express an idea through a set or series of drawings or paintings.
5. Have each student prepare a short speech on what he least (or most) likes, and have the student record this speech for presentation to a class.
6. Have each student prepare or find a very short poem, prose, or paragraph to be memorized or recited before a group.
7. Have each student give a short speech on his favorite brand of motorcycle, car or truck.
8. Have each student critique the above speeches.

Suggested references: E(a) - 4-6, 8, 12, 19

Problem Area No. 5: Making the Individual Count

Objectives: Develop the knowledge and ability of the student to:

1. Recognize individual differences.
2. Get along with individuals.
3. Trust people.

Suggested activities:

1. Organize or join a club.
2. Act out the responsibilities of officers and members of a group.
3. Study Robert's Rule of Order regarding the right of an individual.
4. Plan group activity to involve all students.

Suggested references: E(c) - 1, 6

Problem Area No. 6: Conducting Organizational Business in a Democratic Way

Objectives: Develop the knowledge and ability of the student to:

1. Elect officers.
2. Develop an agenda.
3. Use parliamentary procedures.
4. Use committees.

Suggested activities:

1. Select a temporary chairman for the purpose of opening the meeting and taking nominations.
2. Discuss guidelines to be followed by the class members.
3. Use a good booklet on parliamentary procedure for additional guidelines.
4. Ask the class to nominate individuals for given offices.
5. Write names of candidates on the chalkboard.
6. Follow guidelines and proceed with voting.
7. Discuss and determine responsibility of the officers.
8. Role-play the job of a chairman, secretary, and treasurer using an agenda developed by the class.
9. Appoint several committees and have them work on assigned tasks. Each committee reports back to the class.

Suggested references:

Problem Area No. 7: Making Good Use of Leisure Time

Objectives: Develop the knowledge and ability of the student to:

1. Identify recreational activities.
2. Develop a recreation program.
3. Participate in community activities.

Suggested activities:

1. List all possible types of recreation.
2. Identify types of recreation in the community.
3. Make chart of social (group) recreational activities.
4. Make chart of individual activities.
5. List family recreational activities.
6. Group activities according to investment and skill.

Suggested references: E(c) - 15

Problem Area No. 8: Serving My Country

Objective: Develop the knowledge and ability of the student to:

1. Understand what it means to be a good citizen.
2. Know ways that junior and senior high students can serve their country.
3. Know basic precepts, creeds, codes and allegiances which are inherent in our American democracy.
4. Know the proper use of the flag.

Suggested activities:

1. Discuss the meaning of being a good citizen.
2. Learn the "Pledge to the Flag".
3. Study the Preamble to the Constitution and the Bill of Rights.
4. Fold and properly display flag.
5. Determine the proper use of the flag.
6. Conduct a community clean-up campaign.
7. Present an assembly program on citizenship.
8. Build a float for a parade on one of the patriotic days. (Memorial Day, July 4 or Armed Forces Day)
9. Prepare bulletin board exhibits on patriotism or citizenship.
10. Present patriotic programs for civic groups.

Suggested references: E(c) - 23

Problem Area No. 9: Grooming and Dressing for the Occasion

Objectives: Develop the knowledge and ability of the student to:

1. Select clothes for the occasion.
2. Practice grooming and cleanliness.

Suggested activities:

1. Have panel discussion on grooming and cleanliness.
2. Scrub hands with hand brush and manicure nails.
3. Select proper dress for school.
4. Launder clothing and iron shirts.
5. Visit clothier for demonstration on fabric, style, and color combinations.
6. Use color wheel to pick most flattering colors for each student.
7. Visit clothing store and pick out wardrobe for each student.
8. Select clothing for religious service and school formal affairs.
9. Interview employer for importance of grooming.
10. Select clothing for the job interview.
11. List essentials of cleanliness.

Suggested references: E(c) - 4, 9, 18, 21, 22

Problem Area No. 10: Meeting and Introducing People

Objectives: Develop the knowledge and ability of the student to:

1. Discover the good and bad elements in meeting and introducing people.
2. Become proficient at meeting and introducing people.
3. Improve their leadership by telling and showing classmates what they have learned.

Suggested activities:

1. Invite the mayor or another city official to discuss with the students the importance of meeting and introducing people.
2. Make a list of the steps followed in meeting people.
3. Have students role-play meeting each other.
4. Make a list of rules involved in introducing people.
5. Have students introduce themselves to community leaders, explain why they're doing so, and obtain their signature as proof of completion of assignment.
6. Have a party. Each student must invite a guest that most of the class doesn't know and they must introduce the guest to everyone.
7. Send representatives to local club meetings and have them give a short program on meeting and introducing people.

Suggested references: E(c) - 6, 12-14, 17, 19

Problem Areas in Supervised Experience Program

1. Conducting home projects.
2. Keeping records.
3. Borrowing and managing money.
4. Identifying job opportunities in the community.
5. Applying for a job.
6. Keeping the job.
7. Advancing in the job.
8. Preparing for a better job.
9. Developing good work habits.
10. Planning for a career.

Problem Area No. 1: Conducting Home Projects

Objectives: Develop the knowledge and ability of the student to:

1. Define and identify home projects.
2. Select a suitable home project.
3. Plan and implement project.
4. Keep accurate records.

Suggested activities:

1. Visit home project of selected students in upper grades.
2. Determine projects that interest students and can be conducted at home.
3. Construct a display board to post the names of projects to be conducted by respective students.
4. Visit homes of several class members to determine the availability of land for crop projects and building facilities for animal projects.
5. Determine approved practices for conducting project.

6. Record in project book expenses and receipts. Use the single enterprise project book.
7. Summarize the project book and evaluate the project when completed.

Suggested references: F-13, 14, 20

Problem Area No. 2: Keeping Records

Objectives: Develop the knowledge and ability of the student to:

1. Identify records that should be kept.
2. Determine ways of keeping records.
3. Use records that have been kept.

Suggested activities:

1. Discuss the limitations that people have in remembering information and facts over a period of time.
2. Identify and list methods of keeping records.
3. Keep a comprehensive record in single enterprise of project books of single enterprises conducted at the land laboratory.
4. Practice posting records to learn to be legible and neat.
5. Keep records of individual home projects.
6. Have a contest to determine the best kept project record book.
7. Summarize records and determine profit or loss. Evaluate the projects in light of the summarized records. Compare student records.

Suggested references:

Problem Area No. 4: Identifying Job Opportunities in the Community

Objectives: Develop the knowledge and ability of the student to:

1. Identify jobs that have been filled by recent dropouts or high school graduates.
2. Identify businesses that are actively recruiting workers.
3. Identify future openings for high school dropouts and high school graduates.
4. Determine the value of high school education or more in getting a job.

Suggested activities:

1. Make a study of all last year's high school dropouts and graduates to determine the job status of each student.
2. On a bulletin board, post advertisements for job applicants or help wanted ads.
3. Invite heads of several businesses to speak to students about present and future employment opportunities.
4. Invite several young, recently employed persons to discuss their job and the opportunity for students to land similar jobs.

Suggested references: F-18, 20

Problem Area No. 5: Applying For a Job

Objectives: Develop the knowledge and ability of the student to:

1. Dress appropriately for a job interview.
2. Identify and communicate skills and strong points.
3. Respectfully ask for the job.
4. Determine the proper length for a job interview.
5. Effectively open and close a job interview.

Suggested activities:

1. Conduct a role-playing situation where some students act as prospective employers and others as prospective employees.
2. Have students prepare a looseleaf notebook of their skills, experiences, background, and strong character traits.
3. Conduct a job-interview session where students would actually interview with an adult non-school individual for a fictitious job.
4. Complement the above activity with the use of videotape which would allow the student to see his own interviewing mistakes.
5. Have students prepare personal vitas which could actually be used during a job interview.
6. Conduct a field trip to the local unemployment office and commercial employment office to observe the physical surroundings, techniques of job classification, and office procedures.
7. Solicit a local employer and a local interviewer in talking with the students about interviewing techniques and methods.
8. Have students look through the want-ads of newspapers and clip out and bring to class, ads for which the individual student might be interested in applying.

Suggested references: F-7, 12

Problem Area No. 6: Keeping The Job

Objectives: Develop the knowledge and ability of the student to:

1. Dress appropriately for the task to be done.
2. Respect authority and the rights of others.
3. Be loyal to boss and business.
4. Be friendly.
5. Perform assigned tasks quickly and efficiently.

Suggested activities:

1. Small groups assigned to specific topics regarding the problem area.
2. Reports to the class by chairman of the small groups.
3. Invite former student, currently employed, to discuss, "What I do to please my boss".
4. Develop a list of attributes that an employed person should possess to keep a job.

Suggested references:

Problem Area No. 7: Advancing In a Job

Objectives: Develop the knowledge and ability of the student to:

1. Select type of dress needed for the job.
2. Determine personal characteristics needed for advancement.
3. Identify characteristics that employers seek in their personnel.

Suggested activities:

1. Visit businesses and determine employer-employee relations.
2. Obtain copies of "code of ethics" and standards for the employees.
3. Obtain a salary grid and job breakdown.
4. Make check list of personal qualities.
5. Determine basis for advancement in jobs.
6. Identify how one may be fired.
7. Determine methods of overcoming individual inadequacies.

Suggested references:

Problem Area No. 8: Preparing For a Better Job

Objectives: Develop the knowledge and ability of the student to:

1. Identify their occupational interests.
2. Prepare a personal data sheet, job experience sheet, a list of personal characteristics of young people, and a personal inventory sheet.
3. Make an interview.

Suggested activities:

1. Determine what are your interests.
2. Prepare a list of things you have to offer.
3. Prepare a personal inventory sheet.
4. Prepare a job experience sheet.
5. Observe and decide what employers are seeking.
6. Decide how to get an interview.
7. Prepare a personal data sheet.
8. Determine who does the talking in an interview.
9. Prepare a list of personal characteristics found in young people who are successful on their first job.
10. Make an interview appointment.
11. Determine why you did or did not get the job.

Suggested references: E(b) - 1
F-8

Problem Area No. 9: Developing Good Work Habits

Objectives: Develop the knowledge and ability of the student to:

1. Recognize the importance of good work habits.
2. Realize how good work habits may lead to successful employment.
3. Determine factors that positively influence the development of good work habits.

Suggested activities:

1. Discuss advantages of good work habits.
2. Identify ways to develop good work habits.
3. Discuss how supervised experience program can help an individual to develop good work habits.
4. Identify available supervised job experience program desired by an individual.
5. Discuss factors that may accelerate the development of good work habits.

Suggested references: F-10, 11

Problem Area No. 10: Planning For a Career

Objectives: Develop the knowledge and ability of the student to:

1. Determine the roles of occupations and careers.
2. Identify occupations and careers.
3. Identify the qualifications needed for occupations.
4. Identify sources of occupational information.

Suggested activities:

1. Identify occupations and careers.
2. Take occupational interest inventory.
3. Take occupational aptitude test.
4. Interview professional and career people.
5. Determine qualifications needed for occupations.
6. Visit an employment agency.
7. Develop an occupation program plan.
8. Identify training programs.

Suggested references: F-8, 12, 18

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APPENDIX A

THE APPLIED BIOLOGICAL AND AGRICULTURAL INTEREST INVENTORY

An instrument to measure learned interest of
Junior High School boys and girls relative to:

-animals
-plants
-mechanics
-business

by

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The Interstate Printers and Publishers, Inc.
Danville, Illinois

THE APPLIED BIOLOGICAL AND AGRICULTURAL INTEREST INVENTORY

Instructions

You are about to take a test to help discover something about your interests. This is not a test of ability. The test is concerned only with your expression of like or dislike for each of 100 activities.

Read each statement carefully and tell how you feel about the activity that it describes. On the separate answer sheet, blacken out the one symbol that best represents your like or dislike for the item. The symbols have the following meaning:

Strongly Like	Like	Undecided	Dislike	Strongly Dislike
A	B	C	D	E

Here are some examples similar to those found in the test:

	A	B	C	D	E
1. Drive a car		L	U	D	SD
2. Work in a garden	SL	L	U		SD
3. Operate a computer	SL	L		D	SD

A person who marks the first item, Drive a car, by blackening the space A means that he Strongly Likes the activity. The marking under D for the second item, Work in a garden, tells that the person believes he would Dislike it. The person taking the test indicated that he was Undecided in his feeling about item three, Operate a computer.

You are ready to turn the page and begin. Be sure to blacken one symbol for each item.

Strongly Like	Like	Undecided	Dislike	Strongly Dislike
A	B	C	D	E

1. Look at livestock at a fair.
2. Show a friend how to ride a horse.
3. Experiment with the growth of animals.
4. Raise wild pheasants.
5. Feed pigs.
6. Brush the hair on a horse.
7. Visit a large hog farm.
8. Watch honey bees at work.
9. Live on a farm that raises livestock.
10. Show an animal at a fair.
11. Watch cows eat green hay.
12. Visit a pet shop.
13. Grow beef cattle.
14. Look at pictures of animals.
15. Wash a beef animal for a livestock show.
16. Watch a baby chick hatch from an egg.
17. Learn names of breeds of dairy cattle.
18. Care for sick animals.
19. Milk cows.
20. Raise cats or dogs.
21. Raise a dairy calf.
22. Gather eggs.
23. Care for baby pigs when born.
24. Attend a livestock sale.
25. Raise tropical fish.
26. Identify insects that injure plants.
27. Mow a lawn.
28. Smell newly cut hay.
29. Harvest garden vegetables.
30. Grow food for people.
31. Learn how to prevent soil erosion.
32. Experiment with the growth of plants.

Strongly Like	Like	Undecided	Dislike	Strongly Dislike
A	B	C	D	E

33. Learn how plants grow.
34. Cultivate crop.
35. Grow flowers.
36. Live on a farm that grows crops.
37. Work in a greenhouse.
38. Watch how fast field corn grows.
39. Water plants.
40. Fertilize a lawn.
41. Work in a flower shop.
42. Learn about growing farm crops.
43. Pull weeds in a garden.
44. Tell how to keep soil from washing away.
45. Trim a hedge.
46. Watch buds become flowers.
47. Plant a tree.
48. Watch wheat sway in the wind.
49. Make a flower arrangement.
50. Prepare soil for planting a crop.
51. Help repair a building.
52. Replace a broken window pane.
53. Drive a farm tractor.
54. Fix an electric cord.
55. Clean grease from machinery.
56. Change a bicycle tire.
57. Repair a corn planter.
58. Check oil in an engine.
59. Paint a tractor.
60. Tighten bolts with a wrench.
61. Learn to "tune up" a tractor motor.
62. Hammer a nail.
63. Learn to weld steel.
64. Saw boards.
65. Take apart a small electric motor.
66. Sharpen tools.

Strongly Like	Like	Undecided	Dislike	Strongly Dislike
A	B	C	D	E

67. Help to lay concrete blocks.
68. Build a doghouse.
69. Adjust and operate a farm machine.
70. Work with tools at home.
71. Make farm equipment in a school shop.
72. Go to a farm machinery show.
73. Build a wooden hog feeder.
74. Help repair a lawn mower engine.
75. Put a new machine together.
76. Have a chance to own a farm.
77. Work in a farm supply business.
78. Be president of the FFA.
79. Take telephone orders.
80. See a movie about life on a farm.
81. Help to develop a camping area.
82. Help a farmer sell produce.
83. Wait on customers.
84. Go for a drive to look at farms.
85. Help to operate a fishing pond.
86. Be a farm worker.
87. Help to keep a picnic area clean.
88. Read about modern farming methods.
89. Work with other people.
90. Help someone to manage a farm.
91. Help to buy and sell used farm machinery.
92. Keep farm income and expense records.
93. Sell garden supplies.
94. Demonstrate new products to farmers.
95. Help to manage a hunting preserve.
96. Act as a hunting guide.
97. Operate a cash register.
98. Work in a state park.
99. Make change for a customer.
100. Work at a garden center.

APPENDIX B

THE APPLIED BIOLOGICAL AND AGRICULTURAL INTEREST INVENTORY

Student Survey

Name______________________________ Sex: Male_____ Female_____
Last First Middle

Mailing address______________________ Date of birth____/____/____
Mo. Day Yr.

Father's or guardian's name______________________________

Occupation of father or guardian______________________________

Employer of father or guardian______________________________

What experience have you had: (Check one or more.)

1. Helping with the crops on a farm .... ______
2. Helping with the livestock on a farm....................... ______
3. Helping to care for small animals .... ______
4. Helping to care for a garden and flowers.................. ______
5. Helping to care for a lawn, shrubs, and trees............. ______
6. Helping to care for a park or forest...................... ______
7. Helping in a farm or garden supplies store .... ______
8. Helping to prepare food products for sale................. ______
9. Helping to operate farm, garden, or lawn machines......... ______
10. Helping to adjust or repair small machines .... ______

Which one of the experiences checked above did you enjoy the most? (Write in the number located to the left of the experience.)

Which of the following subjects would you like to learn more about? (Check one or more.)

1. Growing livestock and crops .... ______
2. Business and store operation.............................. ______
3. Mechanics and tractor operation........................... ______
4. Processing and selling food products...................... ______
5. Growing and selling plants and flowers .... ______
6. Soil, water, and wildlife conservation.................... ______
7. Forestry and tree care .... ______
8. Job opportunities for young workers....................... ______

Would you like to enroll in a high school course to study about one or more of the subjects checked above?

1. Yes______
2. No______

APPENDIX C

SUMMARY OF EXPRESSED AND INVENTORIED INTEREST IN APPLIED BIOLOGY AND AGRICULTURE

Name________________________________ Date of birth_____/_____/_____
Mo. Day Yr.

Home location________________________________

Agricultural experience*________________________________

____

*Experience enjoyed the most encircled.

Learn more about________________________________

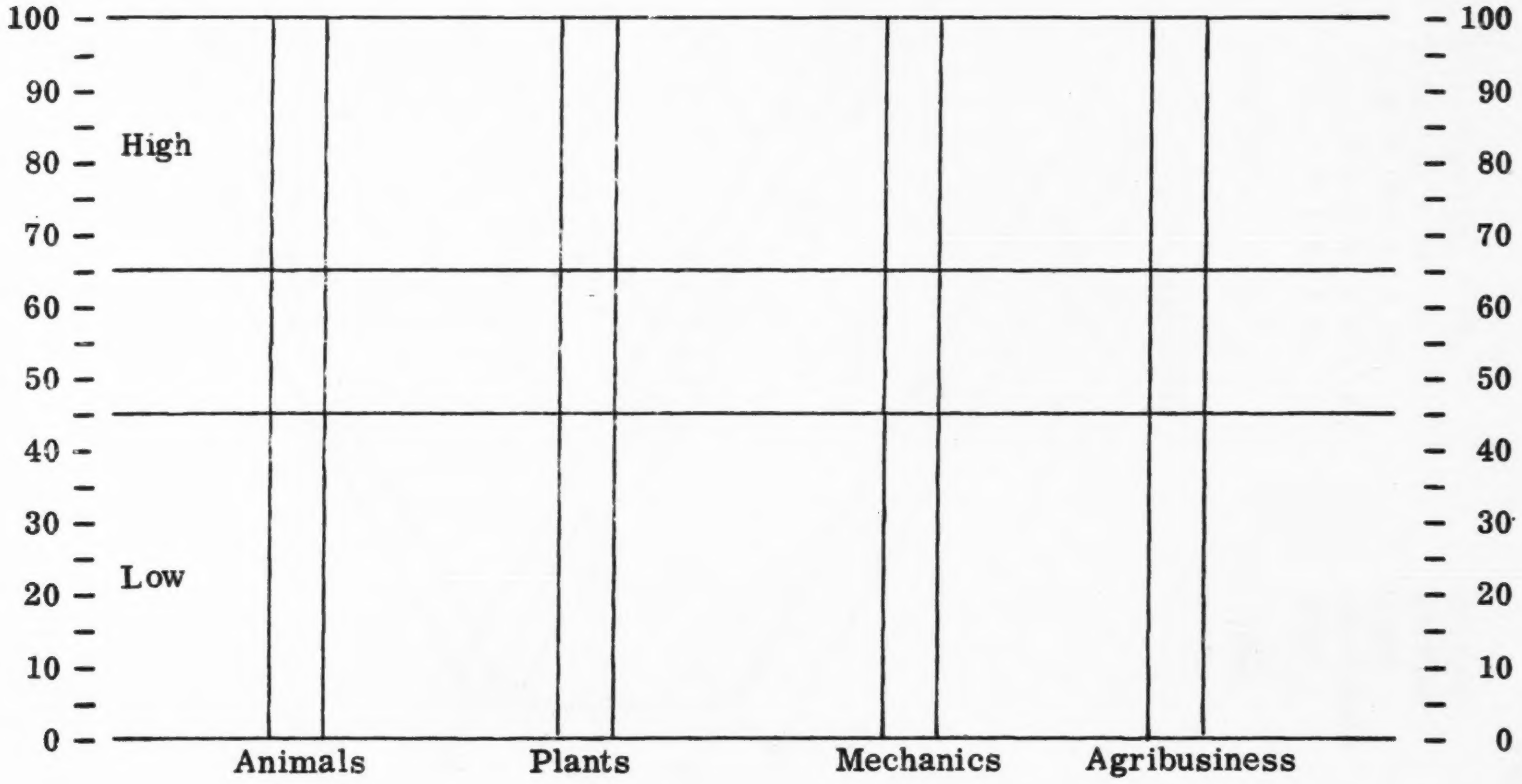
____

____________Desire to enroll in the agricultural occupations course.

Scoring:

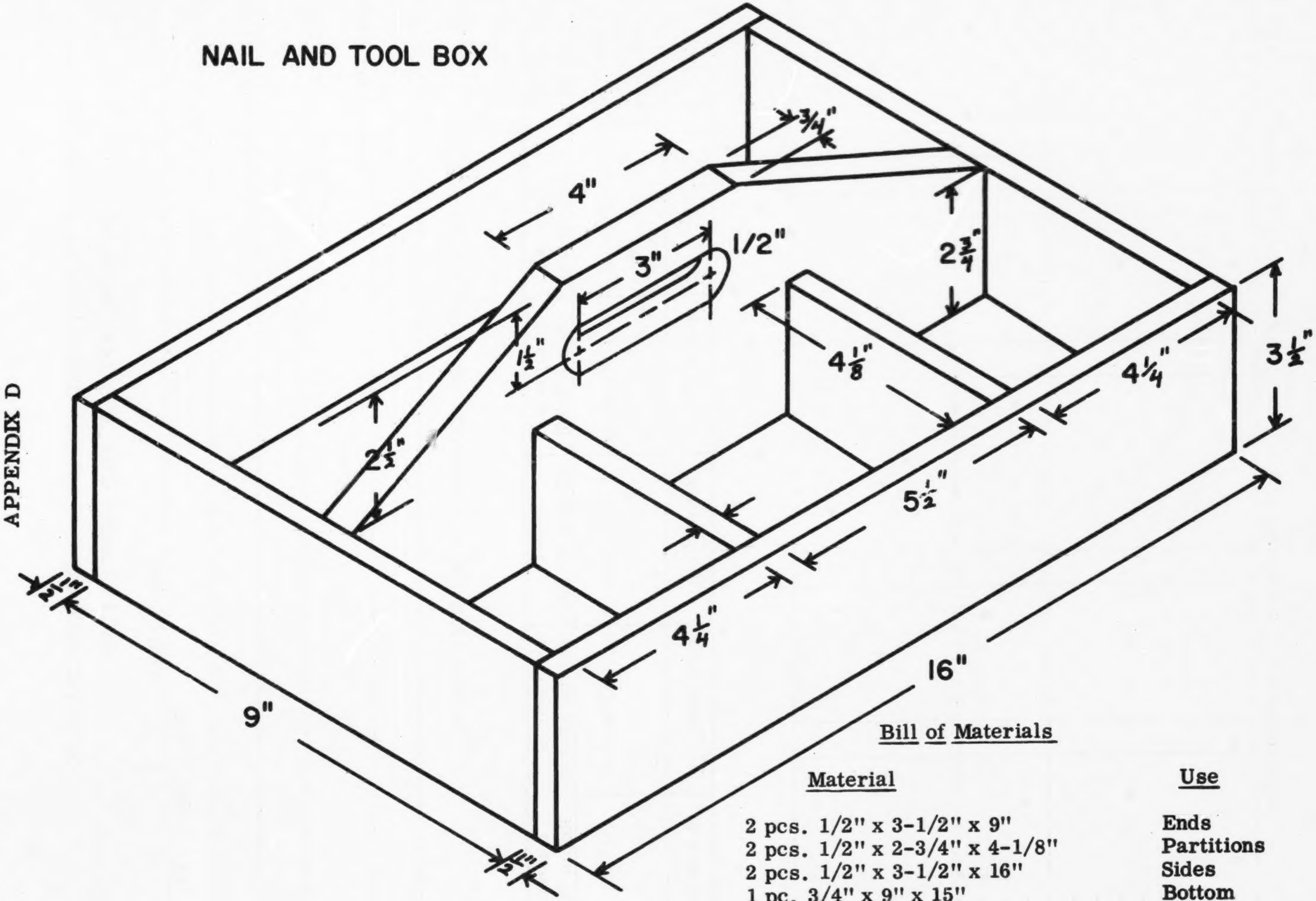
Steps in scoring	General (All items)	Animals (Items 1-25)	Plants (Items 26-50)	Mechanics (Items 51-75)	Business (Items 76-100)
a. Pos. count	___+50___	___	___	___	___
b. Neg. count	___	___	___	___	___
c. Difference	___	___	___	___	___
Score	Same	See table___	See table___	See table___	See table___

Interpretation:



3

NAIL AND TOOL BOX


4"
3/4"
1/2"
3"
$2\frac{3}{4}$"
$1\frac{1}{2}$"
$4\frac{1}{8}$"
$4\frac{1}{4}$"
$3\frac{1}{2}$"
$2\frac{1}{2}$"
$5\frac{1}{2}$"
$4\frac{1}{4}$"
16"
9"
$\frac{1}{2}$"
$\frac{1}{2}$"

Bill of Materials

Material	Use
2 pcs. 1/2" x 3-1/2" x 9"	Ends
2 pcs. 1/2" x 2-3/4" x 4-1/8"	Partitions
2 pcs. 1/2" x 3-1/2" x 16"	Sides
1 pc. 3/4" x 9" x 15"	Bottom
1 pc. 3/4" x 5-1/4" x 15"	Handle